

The Socio-Cultural Sustainability of Animal Farming

An inquiry into social perceptions of dairy farming in the Netherlands and Norway

Birgit K. Boogaard

Thesis committee

Thesis supervisors

Prof. dr. ir. A.J. van der Zijpp
Professor of Animal Production Systems Group
Wageningen University

Prof. dr. ir. J.S.C. Wiskerke
Professor of Rural Sociology Group
Wageningen University

Thesis co-supervisors

Dr. ir. S.J. Oosting
Assistant professor, Animal Production Systems
Wageningen University

Dr. ir. B.B. Bock
Associate professor, Rural Sociology
Wageningen University

Other members

Prof. dr. ir. P.W.G Groot Koerkamp	Wageningen University, the Netherlands
Prof. dr. ir. B. Kemp	Wageningen University, the Netherlands
Prof. dr. M.C.N. Aarts	University of Amsterdam, the Netherlands
Dr. M.S. Haugen	Centre for Rural Research, Trondheim, Norway

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The Socio-Cultural Sustainability of Animal Farming

An inquiry into social perceptions of dairy farming in the Netherlands and Norway

Birgit Katharina Boogaard

Thesis

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Birgit K. Booogaard
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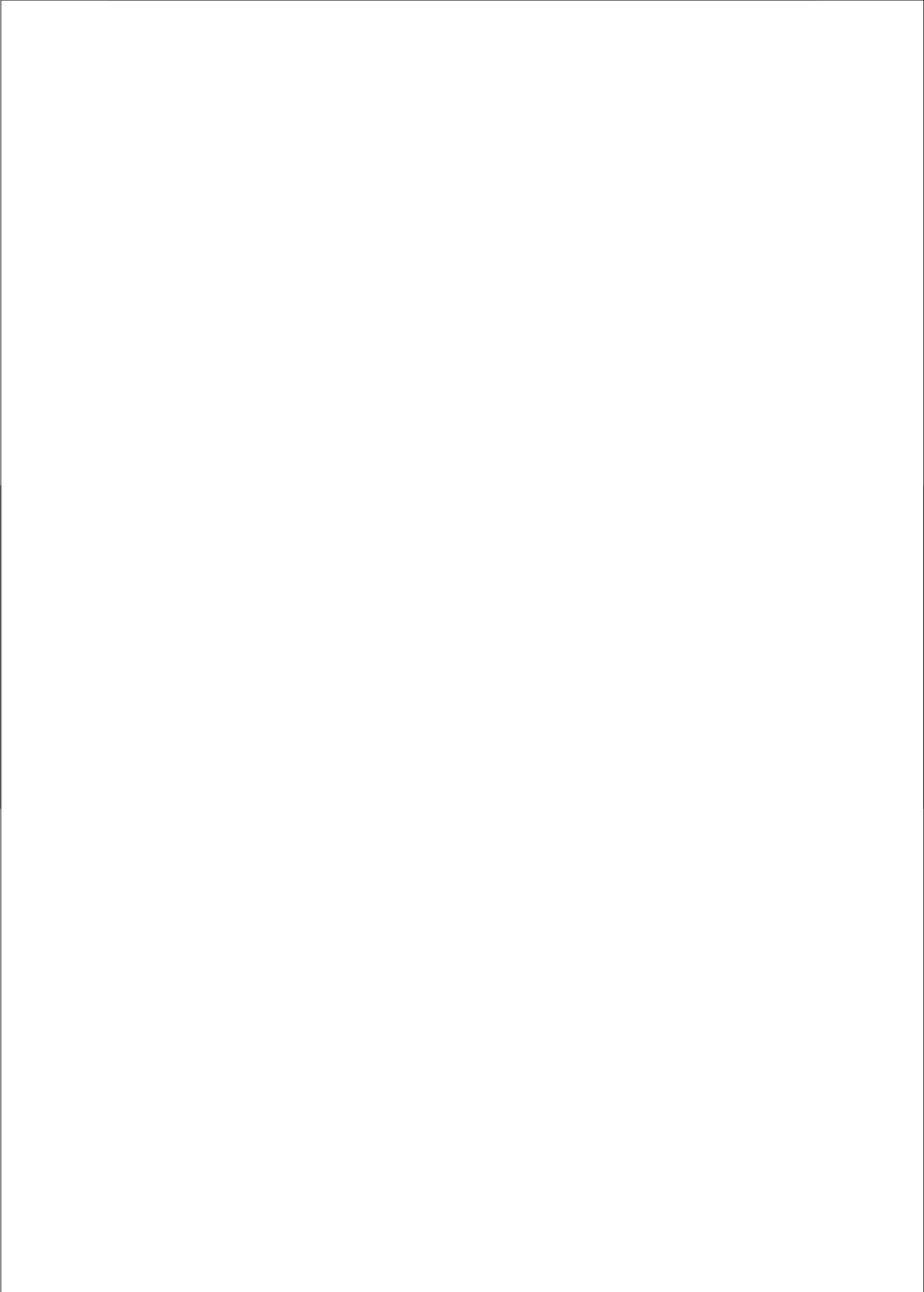
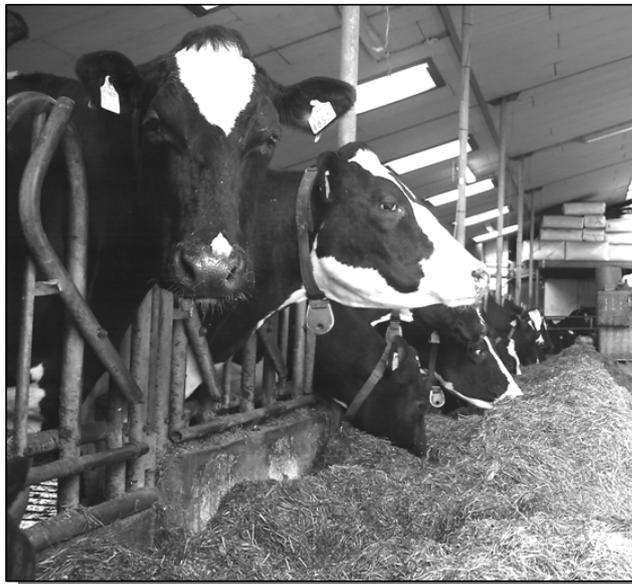


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"This gives a feeling of freedom: food production and private life in one living environment." - NL



*"I hear the mooing of the cows.
It is a nice sound and belongs to a dairy farm." - NL*

Chapter one

Introduction

1.1 Society and sustainable animal farming

1.2 Socio-cultural issues

1.3 Frames of reference

1.4 Values

1.5 Research questions

1.6 Thesis outline

1.1 Society and sustainable animal farming

Animal farming and public attitudes towards animal farming have changed over the past fifty years and the contemporary Western world looks differently towards animal farming than it did before (Fauconnier *et al.* 1992, Dagevos and Sterrenberg 2003). Two developments - occurring simultaneously after World War II - strongly influenced this change: 1) technological innovations industrialized agricultural production, due to higher labour costs and the demand for sufficient affordable food (Bieleman 1998) and 2) society became more urbanized and modernized and the number of people with direct family members in farming decreased. Consequently, many citizens today have little knowledge or direct experience of what farming entails (Fauconnier *et al.* 1992, Frouws 1998, Cloke 2003a). Yet despite this, they most likely carry a mental image or idea of how it was in the past, or at least how it might have been (Fauconnier *et al.* 1992). This is often an idyllic and romanticized rural image where farmers lived in close harmony with Mother Nature while producing our food (Short 1991, Bunce 2003, Cloke 2003a). At the beginning of the 21st century, the countryside is still appreciated for its peaceful and quiet environment compared to life in the city and farming traditions are highly romanticized (Bunce 2003, Cloke 2003a, Van der Ziel and Steenbekkers 2006).

At the same time animal farming is in a constant process of modernization¹ and industrialization (Fauconnier *et al.* 1992). Since WWII, the public has benefitted from achievements of agriculture's industrialization, i.e. increased food production and affordable animal products, although, since the 1960s and 1970s it has been realised that there are downsides to this, with growing awareness of the problems of environmental pollution and animal welfare. At present, there is growing support for animal right organizations, clearly illustrating increasing societal concern towards the treatment of (farm) animals. In the Netherlands societal criticism about animal farming has increased and, a few years ago (in 2002) the world's first 'political party for the animals' was founded. We can conclude that there is a general demand for **sustainable animal farming**, which includes promoting animal welfare, environmental protection and providing healthy and safe food (Hodges 2003 and 2006, Thompson 2006, SER 2008).

The **concept of sustainability** has been much discussed and debated over recent decades in many different scientific, political and public areas. The concept is contested, and is defined and used in many different ways and meanings. This section does not seek to elaborate on the different definitions, as many papers provide insights into this (for a comprehensive overview see for example Hansen 1996). In

¹ Modernization in agriculture refers to a process often involving specialization, scale enlargement, intensification and industrialization of agricultural production (e.g. Van der Ploeg *et al.* 2000)

1987, the Brundtland commission introduced the concept of 'sustainable development' and gave the following – by now famous - definition:

“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” (1987: p43).

This original definition uses the term 'sustainable development' instead of 'sustainability'. By doing so, the Brundtland commission approached sustainability as a *process* rather than a static concept or an end-point (Mollenhorst 2005). Furthermore, even though the amount of definitions and descriptions of sustainable development continues to increase, many studies that explore the concept of sustainable development - including the present one - are based on this definition and underline the idea that **future generations** should not be harmed (e.g. Bell and Morse 1999).

Many studies about sustainable development depart from the basis of three pillars of sustainable development: the economic, the environmental and the social. **Environmental** or ecological sustainable development refers to the regeneration of natural resources (natural capital) such as water, air and land that provide the eco-system for future generations (Russell 1995, Dubois *et al.* 2002). **Economic** sustainable development refers to maintaining the system of economic production through generating sufficient (economic, monetary) benefits, such as income and GDP per capita (Shearman 1990, Hansen 1996, Dubois *et al.* 2002, McKenzie 2004). Russell (1995:pV) defines economic sustainable development as “...the ability of a population to generate revenue to maintain itself in a market economy and produce a surplus to invest in security, research and development, infrastructure, and social safety nets”. Although there is less agreement about the definition of **social** sustainable development (McKenzie 2004), it generally refers to the regeneration of the social system and its continued ability to achieve social objectives such as social cohesion, social mobility, empowerment and equity, institutional development and cultural identity (Assefa and Frostell 2007). Most sustainable development studies that use these three pillars make use of measurable indicators and parameters to assess sustainable development (Kuik and Verbruggen 1991, Hansen and Jones 1996, Bell and Morse 1999, Rigby *et al.* 2001, Von Wirén-Lehr 2001, Zinck *et al.* 2004, Mollenhorst *et al.* 2006).

Studies about sustainable animal farming systems also base themselves on this model of three pillars (e.g. Cornelissen 2003, Mollenhorst 2005, Van Calker 2005, Thomassen 2008) adopting the premise that a sustainable animal farming system should be “economically viable, environmentally sound and socially acceptable” (Mollenhorst 2005: p85, Harrington 1995). Economic viability is defined as “the

ability of the [...] farmer to continue his farming business” (Van Calker 2005: p26). The environmental pillar aims at reducing the (negative) impact of livestock production systems on the environment, through, for example, air and water pollution (e.g. Thomassen 2008). One criticism of such studies is that they “are mainly directed at ecological aspects, some incorporating economic aspects, but generally neglecting social aspects” (Mollenhorst 2005: p90) and that there is limited knowledge about the social sustainable development of animal farming systems. The **aim** of this study, therefore, is to gain insights into social or **socio-cultural sustainable development** of animal farming systems. Values form the essence of culture and strongly influence the description of ‘social sustainable development’. Due to this strong cultural influence this thesis uses the term ‘socio-cultural’. Section 1.4 explains how the term ‘culture’ has been approached.

Sustainable development is culturally defined and is time and space-specific (Brown *et al.* 1987, Shearman 1990, Fresco and Kroonenberg 1992, Roe 1996, Dahlberg 1988, Giddings *et al.* 2002). Socio-cultural sustainable development of animal farming systems is defined by public perceptions. These include concerns, values and meanings about animal farming, which stem from a socio-cultural context. Thus socio-cultural sustainable development is a subjective concept, since meaning is given from different perspectives (Rigby *et al.* 2001). This thesis examines the different social and cultural meanings which animal farming has for society (Thompson 1986). It starts with **identifying socio-cultural issues**, i.e. aspects of animal farming systems which concern the public. Furthermore, it seeks to explain the background to the issues, i.e. **underlying meanings and motivations**.

This study therefore departs from the following questions:

- A) What aspects of present-day animal farming systems are citizens concerned about?
- B) What are the underlying meanings and motivations of these issues?

1.2 Socio-cultural issues

A commonly-used first step in sustainable development analyses is the identification of the relevant issues (Mollenhorst 2005, Van Calker 2005), which are often expressed in terms of concern of the consequences for future generations (based on Cornelissen 2003). There are different ways to identify these issues, for instance via the opinions of experts or of lay people. An ‘expert’ can be defined as “a person whose knowledge in a specific domain is obtained gradually through a period of learning and experience” (Cornelissen *et al.* 2003: p4). Expert-knowledge seeks to select and evaluate the issues as objectively as possible (see also Liverman *et al.* 1988, Kuik and Verbruggen 1991, Harger and Meyer 1996, Bell and Morse 1999, Cornelissen *et al.* 2003). With regard to agriculture, the use of expert

knowledge seems a logical choice since much agricultural research is expert-centred in its nature (Vietor and Cralle 1992). When discussing sustainable development of animal farming, experts usually focus on animal welfare or food safety issues (e.g. Mollenhorst 2005, Van Calker 2005, Van Cauwenbergh *et al.* 2007). However, there might be more issues at stake for society at large, although it is not clear what these issues are (McGlone 2001).

Many studies on **lay people's** perceptions of animal farming view people in their role as consumers. This might be because food can be considered as most people's most important relation with animal farming. This approach, however, assumes that citizens express their concerns about animal farming via their consumer behaviour (e.g. Weatherell *et al.* 2003, European Commission 2005, Frewer *et al.* 2005). Whilst it is probably true that people who are willing to pay more for environmental or animal welfare friendly animal products are concerned about these issues, studies show that the opposite (that people who are not willing to pay more for animal products are not concerned about agriculture or the way farm animals are treated) is not necessarily true, but rather that many do not express these concerns through their purchasing behaviour (Aarts and Te Velde 2001, Dagevos and Sterrenberg 2003, Kanis *et al.* 2003).

The present study approaches lay people in their role as citizens and departs from the premise that is important to "allow people to speak for themselves" (Jones 1995: p 41). There are two reasons for adopting this approach: to identify the range of relevant socio-cultural issues and to gain insights into underlying meanings and motivations. Analysing citizens' perceptions also raises a more ethical question, that of: who is entitled to say what society - and its members - consider sustainable in animal farming? Or: who is an expert on what society thinks and wants? This thesis adopts the position that it is members of society themselves, i.e. the citizenry; who know best what they want and what they are concerned about. Thus this approach presupposes that it is appropriate to include citizens in sustainable development research (Thompson 2006) and in doing so follows Greider and Garkovich (1994), who state that

"in order to better understand socio-cultural issues an interpretative framework is needed including *meanings* that reflect the definitions which people *construct themselves* "
(p5 *my emphasis*).

People ascribe meanings to phenomena to categorize and understand the world around them (Fauconnier *et al.* 1992, Aarts and Van Woerkum 2006). Through these subjective meanings an 'object'

is no longer an object as such, but it becomes a subject with a specific meaning in a specific context (Van der Ziel and Steenbekkers 2006). A description and typification of **collective meanings** is called a '**social construction**' (Jager *et al.* 2004). Berger and Luckmann laid the basis for the theory of social constructivism with their book *The Social Construction of Reality* (1967). They argue that reality is always perceived and thereby constructed by 'the men in the street'. Consequently there is not one 'objective' reality, but multiple realities that exist side by side in society (Berger and Luckmann 1967). In terms of the present study this implies that one cannot say that lay people's perception of animal farming is wrong or is unreal. Lay people might perceive animal farming differently and ascribe different meanings to it than experts, but their "reality" is just as real. Since this thesis seeks to describe collective meanings of animal farming, in a sense it is about providing insights in **the social construction of animal farming**.

1.3 Frames of reference

In order to gain insights into people's perceptions (or 'realities') of animal farming, it is important to understand the factors that influence lay people's perceptions. To this end the thesis uses the concept of 'framing' (Rein and Schön 1986, Aarts and Van Woerkum 2002). **Framing** can be described as "a way of selecting, organizing, interpreting and making sense of a complex reality so as to provide guideposts for knowing, analyzing, persuading and acting" (Rein and Schön 1986: p4). It is a process that helps people categorize and structure the world around them (Fauconnier *et al.* 1992). Frames provide a perspective for making sense of a situation and acting upon it. Thus framing provides evaluative frameworks for making informed judgements (Rein and Schön 1986, Aarts and Van Woerkum 2006). People operate with different frames and consequently, see different things and make different interpretations (Rein and Schön 1986). **A frame of reference** can be described as the whole set of values, norms, convictions, knowledge and experiences which provide the basis on which people perceive, judge and act (Jager *et al.* 2004). Aarts and Van Woerkum (1994) distinguish the following factors in a frame of reference (see also Te Velde *et al.* 2002):

- Knowledge and experiences
- Interests
- Values and convictions
- Norms

Knowledge and **experiences** refer to the amount and quality of factual knowledge that people have of an issue and their experiences with it. The social distribution of knowledge can be highly complex, but is

not problematic as long as citizens generally accept the validity of social knowledge. A problem arises, when taken-for-granted 'reality' is questioned and is no longer self-evident. At this point, social questions and conflicts come to the surface (Berger and Luckmann 1967). With regard to animal farming, it has often been stated that citizens should be (re-)informed about present-day animal farming 'reality' (Fraser 2001, Kanis *et al.* 2003, Holloway 2004). While it is true that the social and spatial distance between citizens and animal farming has increased in the past fifty years (Frouws 1998, Cloke 2003a), it is questionable what the effect of increased knowledge and experiences would be on people's perceptions.

Farmers have an economic **interest** in animal farming, which gives them a different perception of animal farming than people outside the agricultural sector. People use **values**, to define what is 'good' and 'bad' (Termeer and Koppenjan 1997, see also section 1.7). **Convictions** are firmly held beliefs or opinions, e.g. 'animals are subordinate to humans', while **norms** are concrete translations of values into rules of behaviour and habits about 'what is allowed and what is not' (Jager *et al.* 2004). Norms are more specific and imperative than values. All these factors are connected, in the sense that a change in one of them can affect another (Aarts and Van Woerkum 1994). Therefore, these factors should be studied in relation to each other.

It is not only citizens who form opinions on basis of their frame of reference: scientists do the same. They are knowledgeable about their field of research, but their knowledge is neither 'objective' nor value-free, as it is influenced by individual and group perspectives, goals and interests (Vietor and Cralle 1992, Sumner 2005). To give an example; many animal scientists are concerned with "improved productivity, lower costs and greater economic efficiency" (Hodges 2003). These values are so deeply rooted in the scientific mind that they became unspoken assumptions (Hodges 2003). Even though scientists should be responsive to the growing public demand for more sustainable agriculture (Thompson and Nardone 1999), these rooted values can make it extremely difficult for scientists to change their way of thinking. Animal scientists are confronted with a "more complex situation than the profession has faced since it was created" (Hodges 2003: p264) and this suggests a need for critical self-examination.

1.4 Values

'Values' are a topic of study in many fields of social sciences, such as philosophy, psychology and sociology. This thesis explores how values influence people's perceptions and therefore uses value-studies drawn from the field of social psychology.

Despite the many published value-studies, there is no agreement on the definition of a 'value'. Rokeach's book *The Nature of Human Values* (1973) is often taken as departure point. He defines a value as "an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence" (Rokeach 1973: p5). Hofstede made a significant contribution to this field with the now classical book *Culture's Consequences* (1980) in which he describes a value as "a broad tendency to prefer certain states of affairs over others" (p19). More recently Schwartz (2006: p143) has observed that values "serve as standards or criteria that guide the selection or evaluation of actions, policies, people and events". These studies highlight four recurring properties of values, which are of importance for the present study:

- Values function as criteria on which people make evaluations
- Values are relatively stable beliefs
- Values can not be right or wrong, they imply a priority
- Values are the core of a culture

To start with, values function as '**criteria**' or standards on which evaluations are made. In this sense, values function as 'guiding principles in life' (Rokeach 1973) on which people differentiate between what is 'good' and what is 'bad'. As such, values - often unconsciously - influence people's way of living and the choices they make in their lives, for example in their life style, world view, consumer behaviour or political preference. Thus by studying values one can gain a different insight into people's preferences and choices than on the basis of direct motivations such as needs or interests (Oppenhuizen 2000).

In addition, values are relatively '**stable**' beliefs. Vinken and Soeters (2004: p17) note that "values are the most enduring and hardest to change element of culture from which all other elements of culture arise." Why are values so stable? One of the main answers lies in the human process of socialization, as values are internalized by individuals in the early years of their life during primary socialization (Berger and Luckmann 1967). In other words; values are learned in childhood (Engel *et al.* 1993) via the influence of significant others, such as parents and school. After that period, it is highly improbable that the acquired values will change² in the following - secondary - process of socialization (Berger and Luckmann 1967). Thus values are more or less stable, although they can change slowly over time (Becker *et al.* 1983, Abramson *et al.* 1997). This observation is of importance for the present study,

² They can change due to 'traumatic' events or experiences with a heavy impact, such as depressions and wars (Engel *et al.* 1993), but this discussion belongs elsewhere.

because it shows that the influence of values on people's perceptions is less flexible than the influence of direct (often short-term) motivations.

Values can not be 'wrong' or 'mistaken'; they are by definition right. The theory of basic human values (Schwartz and Bilsky 1990) implies that value-differences between (groups of) people do not arise from disagreement on the definition – if a value is 'right' or 'wrong' - , but from differences in **the priority of values**. Differences in value-priorities between cultures can be described as cultural differences (Vinken and Soeters 2004). Several studies have compared cultures and their value-priorities (Inglehart 1997, Schwartz and Boehnke 2004). Such differences are often explained by looking at different cultural dimensions (axes) such as egalitarianism, harmony, embeddedness, hierarchy, mastery, affective autonomy and intellectual autonomy (Schwartz and Boehnke 2004, Schwartz 2006). For example, West-European countries emphasize egalitarianism, autonomy and harmony more than other countries (Inglehart and Oyserman 2004). Within a culture we can also see differences in value-priorities between sub-cultures. Oppenhuisen (2000), for example, designed a value-inventory for the Netherlands reflecting six underlying dimensions and the Dutch institute for public opinion (NIPO) has developed a model for Dutch society based on Oppenhuisen's, Rokeach's and Schwartz's studies: The WIN-model ('Waarden In Nederland', Values in the Netherlands) (Hessing-Couvret and Reuling 2002). This thesis makes use of this model to measure the influence of values on people's perceptions about animal farming (see also section 3.6).

Finally, values are considered as most important fundaments of a culture (Hofstede 1980, Inglehart 1997, Schwartz and Bilsky 1987). Although the precise meaning of **culture** is strongly contested (Morris and Evans 2004, Rose 2007), it is recognized as "central to the organization and operation of society" (Morris and Evans 2004: p95). One could say that culture primarily concerns the production and exchange of meanings (Hall 1997). The present study follows Philo who stated that

"Culture' [is] to take much more seriously than hitherto all manner of things that might be construed as constituting the cultural 'stuff' of human life, not just phenomena routinely designated as cultural, but also *the complete panorama of meaning systems* both collective and more individual."

(Philo 2000: p28, *my emphasis*).

The 'complete panorama of meaning systems' includes different ways in which people give meaning to the world around them and make sense of the world (Rose 2007). These world meanings are strongly influenced by values and much of what we perceive as value for us is rooted in culture (Tuan 1974).

1.5 Research questions

The aim of this study is to provide insights into socio-cultural sustainable development of animal farming systems by studying social perceptions. It starts with two questions:

- A) What aspects of present-day animal farming systems are citizens concerned about?
- B) What are the underlying meanings and motivations of these issues?

Question B can be broken down into two sub-questions. The first is concerned with identifying the collective meanings that underlie these issues, that is, to gain insight into the social construction of animal farming. Secondly it was considered important to seek to understand those factors that influence people's perceptions of animal farming by looking at their frames of reference. Hence, the present study addressed three research questions:

- 1) What aspects of present-day animal farming systems are citizens concerned about?
- 2) What collective meanings are attached to animal farming?
- 3) What factors influence people's perceptions of animal farming?

To answer these questions, this study follows a two-pronged approach, based on two aspects of perception: 1) the perception itself and 2) the influence of a frame of reference (Figure 1.1). The first avenue explores what people perceive and how. This avenue provides answers to the first two research questions - identification of socio-cultural issues and understanding collective meanings of animal farming. The second avenue seeks to discover which factors influence people's perceptions of animal farming, which gives the answer to the third research question.

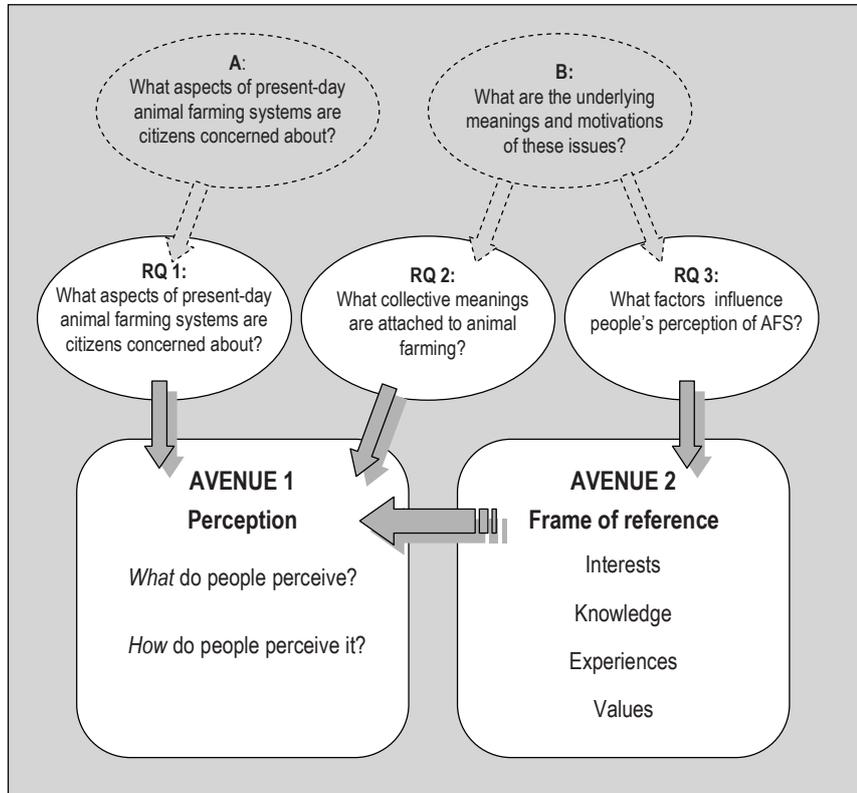


Figure 1.1 Two-pronged approach to social perceptions of animal farming systems (AFS) with three research questions (RQ)

1.6 Thesis outline

The thesis contains nine chapters, with the following structure. The **second chapter** elaborates on social constructions. This primarily sociological chapter, provides a theoretical underpinning to the rest of the thesis and for answering the second research question. The chapter focuses on the social construction of animal farming and describes the theory of social constructivism, illustrated with the social construction of nature, rurality and human-animal relations. The **third chapter** describes the methodological framework, in which perception is approached via qualitative and quantitative methods. The following four chapters are (published) papers describing different aspects of social perceptions of animal farming. **Chapter four** focuses on social perceptions of animal welfare and identifies factors that influence people's perceptions of this (RQ - research question - 3). **Chapter five** discusses sustainable development as a socio-cultural concept and identifies a range of socio-cultural issues of dairy farming in the eyes of Dutch citizens (RQ 1). **Chapter six** explores collective meanings of animal farming and describes three angles of vision (modernity, tradition and naturality) in perceptions of citizens in Norway

and the Netherlands towards animal farming (RQ 2). **Chapter seven** explores one of these angles, modernity, in more depth, describing the two faces of modernity in relation to the social acceptance of dairy farming in the Netherlands and identifies factors that influence people's level of acceptance (RQ 3). **Chapter eight** summarizes the findings in relation to the first three research questions and places these in a broader theoretical and international context. The **appendices** contain two questionnaires of the fieldwork (qualitative and quantitative). Finally, in **the epilogue** I share my experiences as an interdisciplinary researcher who has been engaged in 'a dialogue between animal science and rural sociology' in a personal non-academic way.



“This picture symbolizes the heart of the farm. Ultimately it is all about milk production, this is the place where the animals and the business interest meet every day. This picture shows how the farmer deals with weighing these interests. It made me think that it is possible to combine animal welfare and business interests.” - NL



“The milking equipment was clean and hygienic. This inspires confidence.” - NL

“We all need to have food. Times of crisis might come and then it is good to produce sufficient food ourselves. Nowadays we can buy cheap food from abroad, but we can never be sure about their use of biocides. Let us buy Norwegian food with the guarantee that the products are fresh and free of pesticides.” - NO

Chapter two

Social constructions

2.1 Introduction

2.2 The social construction of nature

2.3 The social construction of rurality

2.4 Human-farm animal relationships

2.5 Implications for the social construction of animal farming

2.1 Introduction

This chapter elaborates on the theory of social constructivism and its relevance for the present study. It starts with the cultural turn in (rural) sociology and how this brought about a change in the interest of rural sociologists from doing research with a political-economy focus to research based on the social and cultural meanings of phenomena. It subsequently describes the basics of social constructions and continues by describing “nature” and the “rural idyll” (idyllic and romanticized images of the countryside) as social constructions of urbanised Western societies. It then provides an overview of changing human-animal relations in the 20th and 21st centuries, focusing on farm animals. At the end of each section the implications of the theory for the present study are drawn out. The chapter concludes by summarizing the main points of importance for understanding the social construction of animal farming.

Since the mid 1990s, rural sociology became increasingly interested in the social and cultural meanings of phenomena and moved away from its previous concentration on political-economic approaches (e.g. Marsden *et al.* 1987, Marsden 1990). In this, rural sociologists are following a broader shift in the social sciences, which can be described as a ‘**cultural turn**’. This is best characterized “by a heightened reflexivity toward the role of language, meaning and representations in the constitution of ‘reality’ and knowledge of reality” (Barnett 1998: p380). This has led social scientists try to seek insights into cultural aspects of phenomena via “detailed investigations into the shadowy recesses of human perception, cognition, interpretation, emotion, meaning and values” (Philo 2000: p32), all topics within cultural studies (Cloke 1997). The cultural turn in rural sociology opened up the way to thinking and looking differently at the rural and at nature and is associated with a growing interest in **socio-cultural constructions** (Cloke 1997).

The basic idea of social constructivism assumes a context-dependency of phenomena, which means that they are determined by the social context in which they are situated. The theory of social constructivism goes back to Berger and Luckmann’s book *The Social Construction of Reality* (1967) in which they refer to reality “as it is available to the common sense of ordinary members of society” (p33). They state that:

“The world of everyday life is not only taken for granted as reality by the ordinary members of society in the subjectively meaningful conduct of their lives. It is a world that originates in their thoughts and actions, and is maintained as real by these.” (p33)

Berger and Luckmann argued that the meanings of reality are subjective and context-dependent. Since

many contexts exist there is not one reality, but multiple realities. A social construction can then be described as a description or typology of collective meanings of phenomena (Jager *et al.* 2004). The theory of social constructivism has been widely applied since Berger and Luckmann first wrote, and has been interpreted in many different ways, and been applied to different topics (Sismondo 1993, Demeritt 2002). Nevertheless, it still holds that the theory generally assumes that phenomena only exist because the way that society has constructed them and that they would look differently if constructed by another society, with different values, needs or interests (Boghossian 2001). This study adheres to the line of thinking that emphasizes 'the phenomenological source' of social constructivism³. Social constructivists "insist that things are not as they seem" (Demeritt 2002: p776), which implies that what may be accepted as self-evident, could well have been different if constructed in another way. Demeritt (2002) argues that social constructivism is often used "to refute taken-for-granted beliefs about the essential nature of things by showing that those things are not natural at all, but instead are somehow socially constructed" (p769).

Until recently, most constructivists focused on the **conceptual element**, the social and cultural meanings of phenomena that underlie a social construction. However, recent studies (e.g. Demeritt 2002, Castree and Braun 2006) have argued that it is also important to recognize the **material element** - the material or physical characteristics of objects themselves - within a social construction, since both elements interact with each other. For example, the material construction of nature depends on the ways people interact with and transform the environment, which in turn will influence what they perceive (Demeritt 2002). Hence, one could say that a social construction is actually a process of interaction between the conceptual and the material elements. The term 'social construction', with its emphasis on the noun 'construction', tends to emphasize only the outcome of the process (Demeritt 2002), but in reality the term also refers to the process of interactions between the material and the conceptual elements (Demeritt 2002, Castree and Braun 2006).

In rural studies, interest in social constructions was initially directed at topics of study: nature-society relations and meanings of 'rurality' (Cloke 1997) and led to an exploration of the social constructions of nature and of rurality. These have become 'hot' topics over the last decade and, in this sense, rural studies has embraced the cultural turn (Cloke and Marsden 2006). *The Handbook of Rural Studies* (Cloke and Marsden 2006) reflects these interests, highlighting "cultural representation" and "nature" as two of the eight 'key theoretical coordinates' in rural research. Despite this, there has been little

³ Demeritt (2002) distinguishes four sources: Phenomenological, the Sociology of Scientific Knowledge (SSK), Discursive constructivism and Actor-Network-Theory.

research into the social and cultural meanings of **agriculture** (Morris and Evans 2004). The present study contributes to this relatively unexplored field by studying the social and cultural meanings of animal farming.

This overview has two important implications for the present study. The first is recognition of the importance of taking into account the interactions between the **material** and the **conceptual elements** of animal farming. The material element of animal farming refers to all the material aspects of animal farming systems, e.g. the landscape, the farm, farm animals and technological equipment. The interaction between the two elements implies that the material element of animal farming depends on the way we have constructed it, which in turn has been informed by social values, needs and interests. With different values, needs and interests – a different conceptual element - the material element of animal farming systems would have developed differently. Section 2.5 describes in more detail how the study approaches the material and the conceptual elements. The second point is that the social and cultural meanings of animal farming, have not been widely studied and need to be approached through **three sub-disciplines** within rural sociology; the social construction of nature, the social construction of rurality and human-animal relationships. These sub-disciplines are explored in the following three sections.

2.2 The social construction of nature

There is a well established academic division between studies on **nature** and **society**, reflected in the traditional academic differences between the natural and the social sciences. In sociology, “this academic division between a world of social facts and one of natural facts has been regarded as largely uncontentious” (Macnaghten and Urry 1998: p5) or undisputed. For studies on the environment and nature this dichotomy has implied that, natural sciences provide ‘hard facts’ about nature, whereas social sciences identify the impacts of nature upon society and the impacts of society upon nature (Macnaghten and Urry 1998). Natural sciences have frequently considered the role of the social scientist as that of a social engineer, “someone who manipulates and ‘fixes’ society so as to facilitate the implementation of a sustainable society specified in essentially technical terms” (Macnaghten and Urry 1998: p6). Similarly, social scientists tend to see natural scientists as people who deal with “an apparently distinct and analysable nature” (Macnaghten and Urry 1998: p5). However, this way of thinking maintains and enhances the existing dichotomy and it is more fruitful (although also more challenging) to rethink the classical dichotomy between nature and society. For example, one can look at nature as a social construction - as Macnaghten and Urry do in their book *Contested Natures* (1998) – doing so implies nature becoming part of the social realm (Milbourne 2003). Macnaghten and Urry

argue:

“once we acknowledge that ideas of nature both have been, and currently are, fundamentally intertwined with dominant ideas of society, we need to address what ideas of society and of its ordering become reproduced, legitimated, excluded, validated, and so on, through appeals to nature or the natural. And the project of determining what is a natural impact becomes as much a social and cultural project as it is ‘purely’ scientific” (Macnaghten and Urry 1998: p15).

The constructivist way of thinking about nature raises two points. First, it shows that nature rather than being an apparently ‘natural’ - in the sense of ‘taken-for-granted’ – thing is, in fact, a ‘mutable social construct’. This implies that there is no single ‘nature’ as such, only a diversity of contested natures, constituted through a variety of socio-cultural processes (Greider and Garkovich 1994, Eder 1996, Macnaghten and Urry 1998).

Second, it suggests that nature – such as fields, crops, animals, etc – are merely social ‘things’ (Castree and Braun 2006) but this runs the risk of only seeing the conceptual element and disregarding the materiality of nature. Castree and Braun (2006: p168) argue that, in studies of the social construction of nature, the “acknowledgment of the materiality of those things we conventionally class as natural things” is missing. Thus it is more useful to view the social construction of nature as a *process* of interaction between the material and the conceptual elements of ‘nature’.

Views about nature in modern Western society are contested. Rather than being monothematic, social orientations towards, and conceptualizations of, nature are both dualistic and ambivalent (Eder 1996, Macnaghten and Urry 1998, Murdoch and Miele 1999, Van Koppen 2002). At one extreme modernity views nature in terms of its **instrumental value**, providing material means of production (Van Koppen 2002). This view springs from a belief that human progress should be measured and evaluated in terms of domination of nature (Eder 1996, Macnaghten and Urry 1998). While this view has brought material and economic benefits it has also made people aware that human activities can be destructive, and fostered a view where people seek to protect nature (Macnaghten 2006) because of its **aesthetic value**, and because it provides a place where urban dwellers can find peace and quiet (Eder 1996). These views see nature as something to be enjoyed and even worshipped (Macnaghten and Urry 1998). Van Koppen (2000) describes this conceptualization as an ‘Arcadian’ interpretation of nature, the roots of which are deeply anchored in culture and history. Social representations of Arcadian nature cluster around two ideal-types: the rural idyll and wilderness.

These opposing meanings of nature also recur in the meanings of animal farming. On the one side,

farmers actively intervene in nature: the domestication of plants, animals and land is the very basis of farming. The **instrumental values** may be obvious: cultivating and controlling the natural environment in order to produce food and make money (Eder 1996). However, the increased mechanization and intensification of agriculture is now also perceived as a threat to nature because of its negative environmental effects (Short 1991, Macnaghten and Urry 1998). At the same time, the countryside as a whole, the *locus* of farming, is appreciated for its **aesthetic values**, including peace and quietness and the opportunity to view grazing animals. Farm animals are often viewed as icons of nature and rurality, giving rise to concerns about contemporary ways of production (Buller 2004). This ambivalence is also reflected in social attitudes to products of farm animals (Murdoch and Miele 1999). The idea that nature is benign and essentially good, gives rise to views that the more natural something is, the better it is (Buller and Morris 2003). As such, there is a growing demand in society for natural and naturally produced food and new food movements have come into being, demanding more 'natural' and 'traditional' foods, as these are considered to be of a higher standard and quality than industrially produced foods (Murdoch and Miele 1999).

Thus, the ways in which nature is socially constructed has two implications for the present study. First a study of society and animal farming is likely to embody the **classical academic dichotomy** between society and nature, as it concerns both humans (the focus of the social sciences) and animals (part of the natural sciences). Each discipline has its own approach. The majority of animal sciences studies approaches animal farming entirely in terms of the material elements, describing it in terms of hard facts and technological solutions. By contrast, rural studies are concerned with conceptual elements of farming. The social constructivist approach is useful in that it provides a way to cross these scientific boundaries, offering possibilities to include both the material and the conceptual elements. Second, the different meanings of nature in modern societies put animal farming in a **double position**; animal farming is not entirely nature (it is domesticated), but on the other hand it is not truly 'humanized' either (it still contains elements of nature, primarily the animals themselves). This latter point is further discussed in section 2.4.

2.3 The social construction of rurality

Since the 1990s, the social construction of rurality has become a topic of study in rural sociology and a way of exploring the social and cultural meaning of the countryside. This work has highlighted that the term **rural idyll** is contested, and its meanings and interpretations vary with time and space (Short 2006). To start with, veneration of the countryside only came with the development of an urban society and of crowded, noisy and dirty cities, often characterised as 'Babylon' (Short 1991). By contrast, the

countryside acquired a positive image of a 'rural idyll' or 'pastoral myth', where there is peace and quiet and where people and animals live in harmony. In this view the countryside offers a "refuge from modernity" (Short 1991: p34) and is idealized as intermediate landscape between "the rough wilderness of nature" and the "artificiality of the town" (*ibid*: p35). Hence, the 'rural idyll' only acquires meaning in contrast to an 'other' which is far from idyllic (Short 2006). This contrast raises many recognizable binary opposites, such as rural/urban, peaceful/noisy, slow/fast, clean/dirty (Tuan 1974, Short 1991, Cloke 2003a, Bell 2006, Van der Ziel and Steenbekkers 2006). The idyll is also a reminder of the past (Short 1991, Bell 2006): in many countries it makes an important contribution to a sense of national identity (Short 1991, Bell 2006) containing a combination of elements including nature, romanticism, heritage authenticity and nostalgia (Bell 2006, Short 2006).

Thus in many ways the rural idyll is an **urban construction** – "a product of the bourgeois imaginary" (Bell 2006: p150) – which developed as a reaction to urbanization, industrialization and modernization (Bell 2006). Today it continues to provide an idealized or romanticized image of the countryside. Four literary and artistic streams have contributed to deeply embedding the rural idyll within contemporary Western culture (Bunce 2003): the green language of the pastoral and picturesque, country life literature, children's literature and landscape painting. The 'green language' goes back to English and American poets and writers in the 18th century who praised the rustic and scenic countryside. Country life literature has existed since the early 19th century and frequently extols "agrarian simplicity and virtue" (Bunce 2003: p22). In many countries, country life magazines such as 'Country Living' are very popular and the television programme 'Farmer seeks a wife' has also gained wide popularity. The idyllic image of the countryside has also been merchandized and marketed in children's books since WWII (Horton 2003). Although the exact representation of the rural idyll in children's literature has varied over the years, in general it emphasizes the virtues and romance of life in the countryside, views which strongly influence our perceptions of the countryside in later stages of life (Horton 2003). People have been "culturally attuned from childhood to make the link between the rural and the 'good'" (Short 2006: p143). Finally, since the 19th century, paintings of romantic landscapes became popular among the general public, which contributed to the creation of an idyllic rural image (Van Koppen 2002).

It is important to note that this idyllic image of the countryside has become separated from the realities of modern day **agricultural production** (Frouws 1998). Contemporary agriculture is frequently associated with – and blamed for – environmental damage, animal welfare issues and food and animal health scares (Frouws 1998, Van Dam *et al.* 2002, Holloway 2004) and animal farming is associated with the nightmarish images of the BSE crisis (Bell 2006). The persistence of the 'rural idyll' is

remarkable in the sense that it would be likely that these modern negative images of farming would undermine its validity. Instead, it seems like people are willing to 'forget about' or 'close their eyes to' agriculture's 'production-oriented-side', and retain a romanticized and nostalgic image of the countryside (Franklin 1999). Thus, the realities of modern day agricultural production are disconnected from the countryside in order to maintain this idyll. In some respects, the rural idyll not only tends to ignore the realities of agricultural production, but in some respects has even "turned against farming" (Short 2006: p143), in the sense that present-day farming does not fit in the idyllic image. In response, attempts are being made to re-embed agricultural practices and products within this idyllic image through, for example, organic farming and marketing practices that emphasise naturalness (Bell 2006).

This disconnection between the rural idyll and agricultural realities has been increased by the higher living standards and the increased mobility that people have experienced since the 1960s (Van Dam *et al.* 2002). The countryside has increasingly come to be considered as a recreational space (*ibid*) with more calls for it to function as an area for rest and relaxation, a respite from the city, associated with work and stress (Short 1991). This hedonist representation, views the 'ideal countryside' as contributing to 'quality of life' with its beauty and attractiveness providing a contrast to the crowded and busy cities: a view in which the countryside becomes the cities' 'playground' (Frouws 1998). The core problem of the rural idyll is that it is a manufactured landscape that exists as "an act of purification" (Bell 2006: p150). Yet such purity is always under threat from pollution (Bell 2006), urbanization, traffic, industry and agricultural practices (Frouws 1998) and people do not (want to) acknowledge these aspects that defile a 'pure' countryside.

To summarize, in the 21st century, the pastoral image - where people live in harmony with nature and animals - is much greatly valued and the public tends to see the rural landscape from such an idyllic perspective, rather than seeing a landscape of agricultural production. In so doing so, people tend to ignore the agricultural production function of farming.

2.4 Human- farm animal relationships

The relationship between farm animals and humans is one of the oldest and most intimate of all society-nature relations (Buller and Morris 2003). Over millennia humanity has been taming and domesticating, animals for its own purposes (transport and traction, providing food and protection) and this represents one of the most important expressions of human dominion over nature (Buller and Morris 2003). The **society-nature dichotomy** becomes problematic when studying farm animals, because they cannot readily be located within nature (as they are affected by more than natural processes), nor are they part

of society (as they remain materially distinct from humans) (Buller 2004). This implies that social scientists “need to take into account the more-than-social world” referring to the inclusion of non-humans, such as animals (Jones 2006: p185). However, by academic tradition, rural studies have mainly focused on humans, and animals have been ignored, or at least remained largely invisible in rural studies (Morris and Evans 1999, Tovey 2003, Jones 2006). This is now changing and over the last few years several rural sociologists have studied human-animal relationships (e.g. Yarwood and Evans 1998, Emel *et al.* 2002, Tovey 2003, Buller 2004, Wilkie 2005, Jones 2006). Such studies can be described as ‘Rural Animal Studies’ (RAS), which has begun to conceptualize and investigate “the complexities, paradoxes and messiness of human-animal interactions” (Jones 2006: p197).

In the 20th and 21st centuries human relationships with farm animals has become more complex: “nowhere is the changed relation between humans and animals in modernity clearer than in transformations in the agricultural industries” (Franklin 1999: p126). To start with, in the last fifty years animal farming has undergone processes of specialization, concentration and intensification, which have increasingly led animals to be treated as ‘economic units of production’ (Yarwood and Evans 1998, 2000). This development is an intrinsic part of the process of modernization which has led to farm animals being seen more and more in terms of **instrumental values**. Modernity involves the belief that humans can dominate and cultivate nature, using it, including animals, for human purposes (Buller and Morris 2003). This view is underpinned by an (often unspoken) assumption that humans are fundamentally different from, and superior to, all other species (Macnaghten and Urry 1998) and the acceptance of using animals as a resource for human progress (Franklin 1999), in this case the provision of sufficient (and affordable) animal products, including meat, eggs and milk (Franklin 1999, Wilkie 2005). Technological developments, financial support (subsidies) and technological innovation all contributed to large increases in animal productivity, through the industrialization and modernization of animal farming systems (Webster 1995, Wilkie 2005). Today livestock production systems are highly mechanized, intensified, rationalized, require the minimum of human labour and embody many of the principles of modernity.

At the same time though a ‘misanthropic’ view has set in, in which humans are seen as a destructive species, whereas animals are seen as essentially good, benign and peaceful (Franklin 1999). Since the 1970s, different countercultures and social movements have come into being which have stood up for animal rights and explicitly opposed the principles of modernity. At the same time, the social and emotional ties between humans and animals increased with “lay people often speak(ing) of animals in ways that recognize them as participants in a social relationship” (Tovey 2003: p203). These

relationships can be described as 'anthropomorphic tendencies', with people ascribing 'human' emotions, feelings and identities to animals (Buller and Morris 2003). These **social and emotional values** place farm animals in a rather paradoxical position: through increased empathy towards farm animals, we consider them as almost part of society, but at the same time the increasing instrumental use of animals clearly distinguishes farm animals as not being human (Franklin 1999, Tovey 2003, Macnaghten 2004, Wilkie 2005). This paradox is illustrated by the development in which (lay) people increasingly question the instrumental use of animals for human progress and express the view that animals should be loved, cared for and protected (Franklin 1999, Wilkie 2005).

Society's contemporary relationship with farm animals reflects a similar ambiguity as that with nature. Even though farm animals are kept under controlled conditions, they remain part of (managed) nature. As such, farm animals represent the 'mid-point' in social conceptualizations of nature: they are neither part of the 'wilderness' - they are tamed and domesticated - nor part of the artificial urban landscape (Buller 2004). Hence, farm animals represent **values of nature**. Yet at the same time, in most present-day farming systems, farm animals have little opportunity to express their natural behaviour, for example to choose their food or to rear their young (Tovey 2003). This has led farming practices to be called into question, for 'violating' animal welfare (Buller 2004). More and more people express their concern about the treatment of farm animals which they see as part of nature and which deserve protection against (further) damage from human practices (Macnaghten 2004, Tovey 2003, Eder 1996, Buller 2004).

Farm animals have also come to represent **values of culture** (Yarwood and Evans 2000, Buller 2004). The presence of farm animals clearly distinguishes the rural from the city as farm animals are key constituents of rural space (Macnaghten and Urry 1998). Farm animals have a visible role in the countryside (Jones 2006) and specific local breeds are often seen as forming part of the image and identity of a region (Yarwood and Evans 1998). Consequently, rare breeds are being revalued, not for their productivity, but for their contribution to cultural heritage, identity and landscape. In the UK, for example, the popularity of centres for rare breeds is increasing (Yarwood and Evans 1998, 2000).

To conclude, it is clear that people's relationship with farm animals in the 21st century is **ambiguous, complex, contested** and even **paradoxical**, reflecting a diversity of, sometimes contradictory, values (Yarwood and Evans 2000, Buller 2004, Macnaghten 2004, Wilkie 2005). Instrumental values are inevitable characteristics of animal farming and have found their expression through modernization and intensification. Yet at the same time emotional, cultural and natural values have become important and

these instrumental values are no longer taken-for-granted. This study will seek to gain further insights in the social and cultural meanings of farm animals by empirically studying citizens' perceptions of animal farming.

2.5 Implications for the social construction of animal farming

This literature overview has helped identify three key points about the social construction of animal farming: 1) that this is relatively new focus in rural studies, which in turn implies 2) that there have been relatively few empirical studies and 3) the necessity for an interdisciplinary approach.

Over the past decade rural sociology has embraced the cultural turn, mainly focusing on the social constructions of nature and rurality, however, "it stopped at the farm gate" (Buller and Morris 2003: p224, Morris and Evans 1999). As such rural studies have yet to explore the social and cultural meanings of agriculture (Morris and Evans 1999). In addition rural studies have often overlooked animals, although several rural sociologists (e.g. Tovey 2003, Jones 2006) have argued that rural studies should develop theoretical approaches that include (farm) animals. Jones (2006) uses the concept of 'Rural Animals Studies' to refer to a **new field** within rural sociology. This study contributes to this new field by studying the social construction of animal farming and in this endeavour will include the farm as well as the farm animals. Moreover, through applying specific qualitative research methods (including farm visits by the public) this study literally 'starts' at the farm gate in search for people's perceptions of and concerns about animal farming (see chapter three). By doing so, it follows the idea that the cultural turn in agriculture should include "a turn towards an embracing of contemporary public concerns about the agricultural sector" (Morris and Evans 2004: p109). Equally, rural sociology's exploration of the cultural turn has a strong theoretical orientation and as a result there have been relatively few **empirical studies** on the social construction of animal farming.

A social construction has both **material** and **conceptual** elements and it is important to capture both of these within the scope of such a study. This brings us back to the first point within this chapter; that a social construction is a **process of interaction** between the conceptual and the material elements. When studying the social construction of animal farming, one needs to take both these elements (and their interactions) into account. In some studies rural sociologists have not specified which animal species they are talking about (e.g. Jones 2006), too readily put different animals in one category (e.g. Franklin 1999) or refer to all contemporary animal farming systems as 'factory farming', even though there are many different types of farm animals and farming systems. Thus, the input of animal sciences can be of additional value by providing more detailed technological and material knowledge about

different farm animals and different systems. The differences between rural sociology and animal science are historical, and deeply rooted in the classical society-nature dichotomy, which gives rise to different theories, methods and ways of thinking. Rural sociology has traditionally focused on humans and looks at animal farming from a gamma science approach; emphasizing the conceptual element. Animal science, by contrast, is focused on (farm) animals and engaged with technological approaches and 'hard facts' about animal farming; with the emphasis on the material element. The social constructivist approach can be helpful to **cross disciplinary boundaries**, by including both the conceptual and material elements of animal farming. The present study makes use of expertise from both animal science and rural sociology in an attempt to do this.



*"I see production, I see an enterprise, I see a large space.
It is clean and tidy. It looks very well organised." - NL*



*"I smell silage and manure. Smells that belong to the farm.
They are not real bad smells." - NL*

Chapter three

Methodological framework

3.1 Framework: Qualitative and quantitative methods

3.2 Research context

3.3 Farm visits

3.4 Perceiving with all the senses

3.5 Photo-elicitation

3.6 Value-orientations

3.1 Framework: qualitative and quantitative methods

The aim of the present study is to gain insights into the socio-cultural sustainability of animal farming systems through studying citizens' perceptions. The three corresponding research questions were:

- 1) What aspects of present-day animal farming systems are citizens concerned about?
(first avenue, qualitative)
- 2) What collective meanings are attached to animal farming? (first avenue, qualitative)
- 3) What factors influence people's perception of animal farming? (second avenue, quantitative)

To answer the **first research question**, citizen panels were accompanied on visits to dairy farms in the Netherlands. The members of the panels were asked about their sensory experiences - smell, hearing, sight and feeling - and handed a digital camera so they could record important aspects of the dairy farm (appendix I). Sections 3.3, 3.4 and 3.5 focus on three aspects of this qualitative method: the farm visits, sensory perceptions and photo-elicitation.

Social constructions are context-dependent. To answer the **second research question** a comparison was made of citizens' perceptions of animal farming in two national contexts: in the Netherlands and Norway. The same qualitative method was applied in both countries, with citizen panels making farm visits. Section 3.2 focuses on these two countries.

For the **third research question**, the research sought to gain insight into the factors that influence people's perceptions of animal farming. This was done by way of two surveys: the first concerning animal welfare, the second dairy farming (appendix II). The first study built on an existing quantitative dataset from the Rathenau Institute about citizens' perceptions of animal welfare (Verhue and Verzijden 2003). Several questions from this dataset were selected and subject to additional statistical analysis. The second survey study (appendix II) was designed on the basis of the qualitative findings of the farm visits in the Netherlands and included words and issues that lay people spontaneously mentioned during the farm visits. This study allowed for a triangulation of the qualitative findings from the farm visits and helped identify contributory and explanatory factors. People's frames of reference were used as the basis for discovering these explanatory factors. Section 1.5 explained the composition of a frame of reference, on the basis of values, knowledge, interests and experiences. Chapters four and seven explain the relevant variables. For both studies, a representative respondent group from the NIPO-database (Dutch Institute for Public Opinion) was selected by the 'Bureau Veldkamp' on the basis of specified characteristics, including respondents' value-orientation (see section 3.6).

Table 3.1 Relating the research questions and methodologies to the two-line approach and thesis chapters

Research questions	Methodology ^a	Avenue	Chapter
1) Identify socio-cultural issues	Qualitative: farm visits in the NL	1	5
2) Collective meanings of animal farming	Qualitative: farm visits in NO and the NL	1	2 & 6
3) Explanatory factors of citizens' perceptions	Quantitative: two survey studies in the NL	2	4 & 7

^a NL = the Netherlands, NO = Norway

Table 3.1 shows the relations between the research questions, the qualitative and quantitative methodologies, the two-pronged approach and the thesis chapters. The following sections of this chapter elaborate on five aspects of the methodology: the context of this study, the farm visits, the importance of sensory perceptions, the use of photo-elicitation as a research methodology and the use of value-orientations.

3.2 Research context

This thesis studies the perceptions of citizens in the Netherlands and Norway towards animal farming. **The Netherlands** is densely populated and as a result the boundaries between urban and rural areas are becoming less and less clear and agriculture and the countryside are under considerable pressure (Frouws 1998, Van Dam *et al.* 2002). The strong interaction between city and the countryside raises questions about citizens' perceptions of animal farming, such as: what do people want from animal farming and the countryside? How do they see animal farming? What issues are they concerned about? etc. Yet at the same time it was considered important to compare the perceptions of Dutch citizens with those of citizens from another country. **Norway** was chosen as the comparison country, because while also a Western European country, it is less urbanized, has a lower population density and a less intensive agriculture than the Netherlands. For example, the average Norwegian dairy farm has less cows than a Dutch dairy farm; 17 cows per farm (SSB 2007) compared to 65 (LEI 2007). The choice of Norway also allowed a fruitful collaboration with Erling Krogh from the University of Life Sciences (Universitetet for Miljø- og Biovitenskap) in Ås, who has studied Norwegian people's perceptions of landscapes (Krogh 1995).

This study focuses on **dairy farming**, a choice that was made for three reasons. First, dairy farming is less intensive compared to other sectors, such as pig or poultry farming and, as a result, people are likely to have fewer prejudices of fixed concerns against dairy farming. The idea was to identify a range of issues and it was expected that dairy farming would give people the opportunity of seeing different issues, whereas intensive farming systems would be more likely to draw attention to one or two issues (e.g. animal welfare). Secondly, dairy farming is representative of animal farming, in the sense that

many people associate animal farming with (grazing) cows (Frerichs and De Wijs 2002). Finally, dairy farming is embedded in the landscape, because it accounts for a high proportion of land use (about 60% of the Dutch agricultural land area, LEI 2007). This embeddedness in the rural landscape is likely to strongly influence people's perceptions of animal farming.

3.3 Farm visits

The qualitative part of the present study involved conducting farm visits with citizen panels (Figure 3.1). There were two important reasons for these visits. Firstly, many citizens have little experience with agriculture in general, and animal farming in particular. Thus the farm visits were intended to show people what farming actually entails, so they could address issues on the basis of a **real life experience** with the material aspects of farming. Secondly, it was considered important to avoid relying solely on people's ideas and mental images of farming, but to inform these **conceptual** constructs with exposure to the **material** elements – as together these two constitute ingredients that make up the social construction of animal farming.



Figure 3.1 A Dutch citizen panel visits a dairy farm

A panel consisted of eight citizens who visited two dairy farms. Chapters five and six describe the selection criteria and procedures. The visits took place in three areas in the Netherlands (Friesland, Zuid-Holland and Noord-Brabant) and one in Norway (Vestfold see Figure 3.2). Time and financial restrictions meant it was not possible to include more regions in Norway. In each region, two selected

panels visited two dairy farms, with each panel visiting both farms on the same day (one in the morning and one in the afternoon). The field work started with a pilot study in the Netherlands (Zuid-Holland) and when the method proved suitable, it was used in the following phases of the research. In total, six panels (including the pilot study) in three regions, visited 12 dairy farms in the Netherlands in the spring and autumn of 2005 (see also Table 5.3). In addition, two Norwegian panels visited two dairy farms in the autumn of 2006.



Figure 3.2 Farm locations (●): one region in Norway and three in the Netherlands

A farm visit consisted of four steps. First, the panel was welcomed by the farmer, who explained about his or her farm and handed out a sheet with the characteristics of the farm. Subsequently, the panel walked together around the farm, the cowsheds, the farm yard and through the landscape. Then the participants received a digital camera and questionnaire. Panel members answered the questionnaire individually and were explicitly asked to record their own personal experiences (see also section 3.4). The visit ended with the questionnaires being collected and the farmer being thanked for his or her hospitality.

3.4 *Perceiving with all the senses*

The farm visits were intended to provide insights into how people perceive a dairy farm. A real life experience stimulates **all the senses simultaneously** and therefore differs from information received for example via newspapers, television or the internet, all of which only communicate through words,

vision and/or hearing. Each sense has its own characteristics and specialties and information is received and processed in different ways (Tuan 1974). We give meaning to the world around us through this complex web of sensory perceptions (Merleau-Ponty 1970, Tuan 1974, Krogh 1995, Abram 2003). Asking people about their sensory perceptions led them to pay more attention to or **become aware** of experiences, which they might not have noticed otherwise. The on-farm questionnaire contained questions about people's sensory perceptions (see also appendix I). Furthermore recording sensory perceptions provided an appropriate way to elicit **spontaneously expressed reactions** about animal farming systems. The intention was to avoid (as far as possible) respondents being influenced by the agricultural and scientific knowledge of the researcher, which would have occurred if the questionnaire was composed of a list of preconceived topics. Rather the issues raised came out of the panel members immediate and personal experiences. This also gave insights into the **words lay people use**, which was assumed would differ from words used by scientists, farmers or politicians (Jones 1995, Macnaghten 2004). The words and issues of respondents provided an input for the subsequent quantitative survey (appendix II).

The idea of gauging sensory experiences can be traced back to earlier studies in phenomenology (Jacobs 2006). Merleau-Ponty argues in his book *Phenomenology of Perception* (1970) that we only become conscious of something via our **body** - through perception with our senses – and consequently it is through our bodies that meaning is constructed. This idea challenges traditional scientific ways of thinking, which put great emphasis on the primacy of the **mind** (Crossley 2005). In effect science is mainly focused on 'thinking' and tends to ignore the importance of sensory perceptions received through our body (Carolan 2008a, Crossley 2005). This Western world view still dominates how we look at the world today and only recently have sensory perceptions become a topic of study in, for example, sociology (Carolan 2007, Crossley 2005). This study works from the idea that meaning is not only constructed in the mind, but also via sensory perceptions from our bodies. Hence, in order to gain a complete impression of people's perceptions during a farm visit, it is vital to ask about their sensory perceptions and impressions.

Vision plays an importance role in human sensory perception and one could even say that of all the senses, people pay most attention to their visual perception (Tuan 1974). For example, many Dutch people are concerned about the way the landscape looks and the cluttering of the landscape is a hot topic (VROM 2008b). Some argue that the dominance of vision developed at the expense of other senses (Abram 2003: p34) and it is important "to reconnect the seeing-eye to the rest of the body" (Veijola and Jokinen 1994) by paying attention to other senses.

Smell is special in the sense that we can not close our nose, as we can close our eyes. Smell also has the power to evoke vivid, emotionally-charged memories of past events and scenes (Tuan 1974, Macnaghten and Urry 1998). For example, the fragrance of a haystack can evoke nostalgic memories of childhood (Tuan 1974). Smell is an important sense, although it has become less significant in sanitized modern Western societies (Macnaghten and Urry 1998, Tuan 1974). Studies of farm odour emphasize the importance of smell in influencing public opinion about farming and – often depending on the location - farm smells can be perceived positively or negatively (Carolan 2008b). Agricultural odours have given rise to conflicts (Carolan 2008b) and the Dutch government has passed legislation to regulate odour nuisance from agriculture (VROM 2008a).

Our ears are another sensory organ, which like our noses we cannot close (Macnaghten and Urry 1998). An important characteristic of **hearing** is that humans usually react more to what they hear than what they see, even though the eyes gain more precise and detailed information than the ears (Tuan 1974). One only has to turn off the sound on a television to realize the importance of sounds in evoking feelings. The term 'sound pollution', referring to the many 'undesirable' sounds in modern urbanized society produced by traffic, machines, crowds of people, etc, became widely used in the 20st century (Macnaghten and Urry 1998). These 'undesirable sounds' can be - just as 'undesirable smells'- a cause of conflict in urban and rural areas. Urban people appreciate the countryside for its quietness and as a place of contrast to noisy city life, but, there are many sounds in the countryside and some of these can be considered as 'out of place' or 'pollution' by people who expect quietness (Macnaghten and Urry 1998).

Touch - the tactile sense - gives humans an enormous amount of information about the world (Tuan 1974). For example, a surface of glass is easily differentiated from a wooden surface merely by touching it. Practice can increase sensitivity, as shown by blind people who learn to understand the world around them on the basis of feeling (and hearing). One can even say that 'to see is not yet to believe' (Tuan 1974: p8), but when one touches or feels the object, it is *real*, and independent of our imaginations (Tuan 1974).

The questionnaire used in this study contained questions about these four sensory perceptions; vision, smell, hearing, and feeling (Figure 3.3 and Appendix I). To start with, people were asked what they **saw** and they recorded 10 images with a digital camera (see also section 3.5). Subsequently, people were asked what they **smelled** on the farm and if - and why - this sensory perception was positive, negative or neutral. Thereafter, panel members were asked to close their eyes somewhere on the farm and to

listen to what they **heard** and then write down what they heard and evaluate if - and why – they felt positive, negative or neutral about these noises. Finally, people were asked to write down an overall-**feeling** during the farm visit. Thus, instead of asking literally about what they felt, via 'touching', they were asked about their emotional feelings, i.e. if were they happy, sad, disappointed, etc. during the visit.

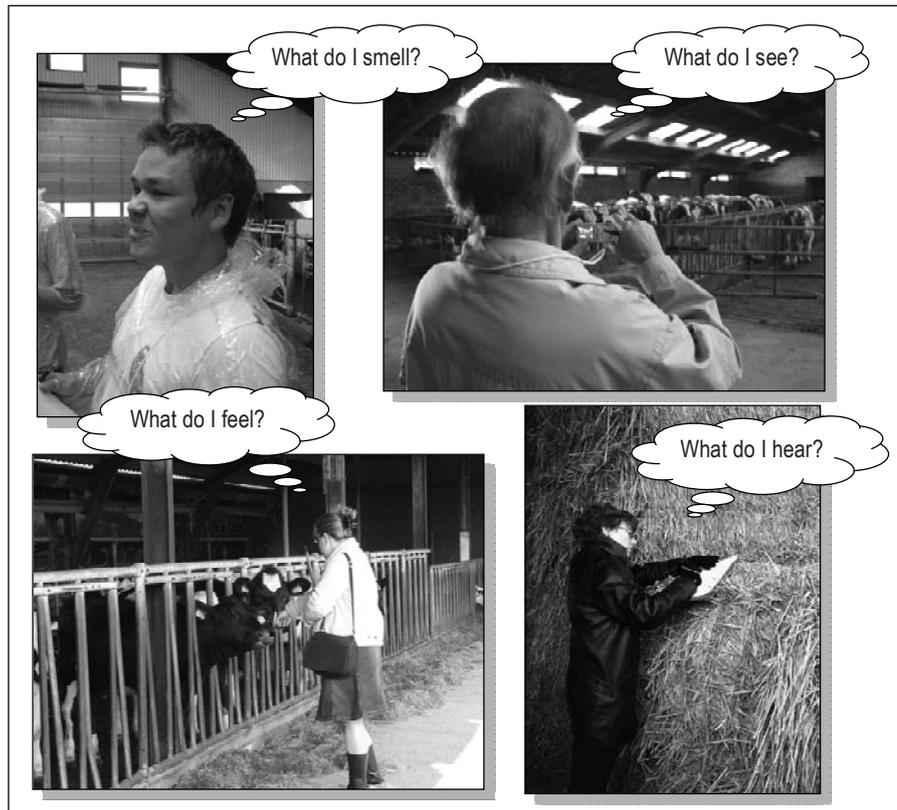


Figure 3.3 Perceiving a dairy farm with all the senses

3.5 Photo-elicitation

As mentioned before, sight is often considered to be the most important and used sense in Western societies (Rose 2007). Images convey something about how we see and interpret the world and as such visual impressions can also be used in research. Several of the social sciences, such as anthropology and geography make common use of images, for example by mapping. More recently, sociology and human geography have started to pay attention to visual methods by including images in their studies. 'Visual sociology' is a more recently developed sub-discipline, in which images are used as a way of addressing a sociological research question, e.g. via photography. Sociologists are not so much

interested in what photographs are, but instead use photographs as a means to an end, since photos can “achieve something that methods relying only on speech and writing cannot” (Rose 2007: p238). In this sense, photos are “unique sources of evidence in social science research” (*ibid*: p238). There are different methods for including photographs in sociological studies, for example photo-documentation (by the researcher) and photo-elicitation (by the respondents).

This study makes use of photo-elicitation, inspired by Katrine Højring, who has studied farmers’ perceptions of nature and the rural landscape by handing out disposable digital camera’s and asking them to record their living and working environment (Højring and Noe 2004). This method also seemed appropriate for looking at animal farming from citizens’ perspective. Asking citizens to take pictures of things they saw at a farm helps us to ‘look through their eyes’ and ‘see what they saw’. Furthermore, photo-elicitation gives people a tool through which they (often sub-consciously) express their concerns and deeply held values and thus provides insights into their concerns and values in relation to animal farming (Beilin 2005). These concerns can be identified not only through the act of taking of a photo, but also the possibility of later reflecting on the meaning of the photo or reason for taking it.

Photo-elicitation is often characterized as a six stage process (Rose 2007) and these stages were followed in this study. The initial meeting with panel members provided an **introduction** to the content and purpose of the research. Subsequently, participants were given a **digital camera** and instructions on selection criteria and how many pictures should be taken. In this study people were asked to take 10 pictures of things they found important to preserve for the future. This was hoped would provide insights into what people considered as valuable aspects of the farm and their underlying concerns. During the farm visit people could also write down short notes as a reminder for the following stages. In the third stage, the photos were **printed** and sent back to the participants within one week (including their mnemonics); with each participant receiving 20 photos (10 per farm) that they had taken. The participants were then asked to select the five pictures that represented the most valuable aspects of each farm and explain **their selection**. In the pilot study, an interview with each respondent was conducted to discuss the photos in detail. However - due to time and financial restrictions - respondents in the final method were not interviewed face-to-face, but asked to select the pictures at home and sent their written explanation back by mail, within two weeks. The combination of photos with written explanations proved to be a fruitful research method as it gave detailed information about how respondents saw the farm and also allowed participants the opportunity to reflect on the photos two weeks after the visit. In the fifth stage, the texts and photographs were **analysed** using Atlas/ti - a programme for qualitative analysis (see chapters five and six). The written explanations were important

inputs for the analysis, as the images and words become more significant when considered in relation to each other, i.e. the visual materials benefit from some written context that clarifies their meanings (Rose 2007). The analysis did not differentiate between individual sensory perceptions, as it was more concerned with perception as a whole. Hence, sensory perceptions were used as a way to better understand how people construct their images of animal farming. Finally, the results were **presented** in written form and citations and pictures were used to illustrate and underpin the findings.

3.6 Value-orientations

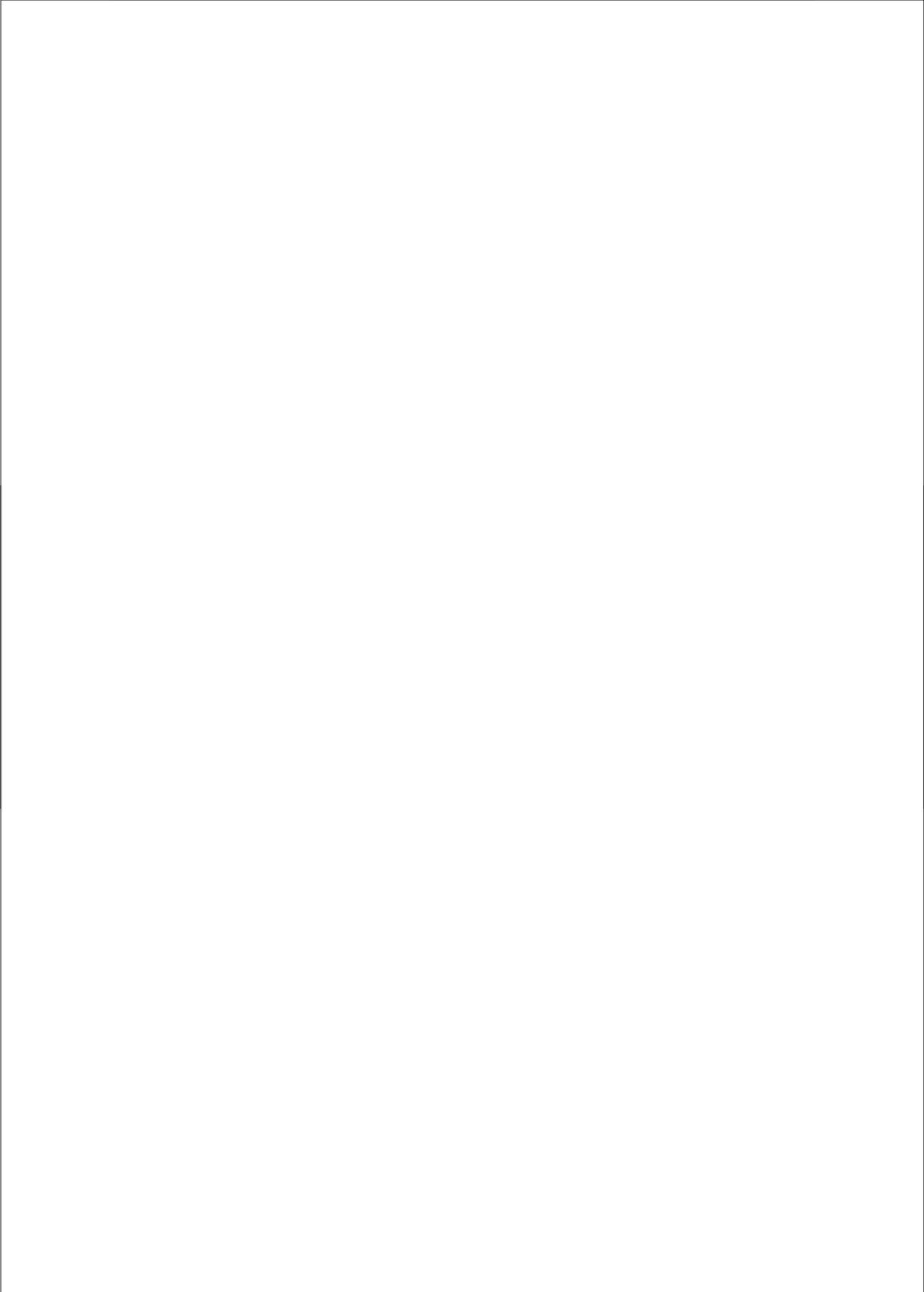
Values are **implicit**: therefore the biggest challenge in studying them is to make the implicit explicit. There are several ways of doing this, depending on the aim of the study (Jagodzinski 2004). The aim of this study was to understand the influence of people's individual values on their perceptions of animal farming. From this perspective, it would be easy if one could ask the question "What are your most important values in life?" and give respondents a list important values to choose from. Unfortunately this approach does not work, because most people are not always fully aware or able to articulate their values. To overcome this problem Rokeach designed *The Rokeach Value Survey* in 1973. This survey consists of two lists of 18 values, which the interviewee is asked to arrange in order of their importance (Table 3.2). Afterwards, the values are clustered according to their priority, giving sets of values - **value-orientations** - that exist within society. A value-orientation is thus a set of most important values for a group of people.

Table 3.2 Rokeach Value Survey: two lists of times 18 values (Rokeach, 1973)

First list ^a	Second list
A comfortable life (a prosperous life)	Ambitious (hard-working, aspiring)
An exciting life (a stimulating, active life)	Broadminded (open-minded)
A sense of accomplishment (making a lasting contribution)	Capable (competent, effective)
A world at peace (free of war and conflict)	Cheerful (light-hearted, joyful)
A world of beauty (the beauty of nature and arts)	Clean (neat, tidy)
Equality (brotherhood, equal opportunity for all)	Courageous (standing up for your beliefs)
Family security (taking care of loved ones)	Forgiving (willing to pardon others)
Freedom (independence, free choice)	Helpful (working for the welfare of others)
Happiness (contentedness)	Honest (sincere, truthful)
Inner harmony (freedom from inner conflict)	Imaginative (daring, creative)
Mature love (sexual and spiritual intimacy)	Independent (self-reliant, self-sufficient)
National security (protection from attack)	Intellectual (intelligent, reflective)
Pleasure (an enjoyable, leisurely life)	Logical (consistent, rational)
Salvation (saved, eternal life)	Loving (affectionate, tender)
Self-respect (self-esteem)	Obedient (dutiful, respectful)
Social recognition (respect, admiration)	Polite (courteous, well-mannered)
True friendship (close companionship)	Responsible (dependable, reliable)
Wisdom (a mature understanding of life)	Self-controlled (restrained, self-disciplined)

^a Instructions: arrange the 18 values in order of their importance to you, as guiding principles in your life (separately for each list).

The Rokeach Value Survey is still used as basis for studying individual values (see for example Hessing-Couvret and Reuling 2002, Oppenhuisen 2000). This study used the Dutch WIN-model (Waardenoriëntaties In Nederland, Value-orientations in the Netherlands, Hessing-Couvret and Reuling 2002) which is based upon the Rokeach Value Survey. This model, which has been developed especially for Dutch society by the Dutch Institute for Public Opinion (NIPO), discerns eight value-orientations in the Netherlands (described in Figure 4.2 and 7.1) and is used as the basis for explaining differences in people's perceptions of animal farming.





"I like the dam with a newborn calf in the field. It is the most natural way: a young animal being born like this, without interference of humans." - NL



"This shows the downside of our human need for a certain product (milk): the calf has to grow up without the dam." - NL

"This picture is valuable to me because it shows that the calves are well taken care of and looked after. The calves can eat hay exactly when it suits them [...]. And when I see this calf in a 'private' and large pen alone with a lot of hay, it makes me happy. That is exactly how it should be." - NO

Chapter four

Social perception of farm animal welfare: a quantitative study in the Netherlands

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Abstract

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Acknowledgements

Abstract

To study societal perception of animal welfare in the Netherlands and to search for intervention possibilities to influence this perception, 1074 randomly selected Dutch respondents completed a questionnaire on animal welfare. We analysed 15 propositions (4-point Likert-scale) and through factor analysis we defined four factors of societal perception of animal welfare: Human-Animal Hierarchy (HAH), Use of animals for Human Consumption (HC), Life Quality of farm animals (LQ), and Farmers' Image (FI). On average, Dutch society perceived farm animal welfare as slightly positive. We distinguished perception into the elements: Values, Convictions, Emotional experiences (with animals and farms) and Factual knowledge. Factors HAH and HC are considered as convictions in Dutch society. LQ is the only element significantly influenced by values. Pet owners and people without farm experiences perceived FI and LQ as being less positive than people without a pet or with farm experiences. These emotional experiences with farms, farm animals and/or pets are important elements of perception. FI is the only element influenced through factual knowledge. Hence, it is important that people experience and learn what farming entails and how farm animals live, e.g. through farm visits.

Keywords: Animal welfare, Perception, Society, Value orientation.

4.1 Introduction

Shortly after the Second World War values like 'food, clothing and fuel' were strongly directive for the socio-economic developments in Western European countries (Becker *et al.* 1983). The main goal of livestock production systems was to produce high quantities of food at low cost prices. During the last decades post-materialistic values as 'freedom', 'self expression' and 'improvement of quality of life' became increasingly important (Abramson *et al.* 1997). For livestock production systems this meant that societal demands for ecological and socio-cultural aspects of production, such as environmental effects, landscape values, food quality and animal welfare became apparent (Hervieu and Hansen 2002). The present paper focuses on one of these aspects, i.e. farm animal welfare. We followed the philosophy of Hemsworth and Coleman (1998) who stated that "although science has an important role in providing sound defensible information on how animals respond to a specific practice, ultimately it is an ethical decision by the general community that will determine the acceptable standards for farm animals". Animal welfare is studied in many disciplines and it may be defined in many ways (McGlone 2001). Although much research had already been done, Serpell (2004) emphasises that "no amount of scientific evidence will ever be sufficient to bring about improvements in animal welfare unless this evidence also speaks to public attitudes and values". Perception of animal welfare is often approached from a consumer's perspective (Te Velde *et al.* 2002, Dagevos and Sterrenberg 2003). The present paper focuses on societal perception of farm animal welfare and addresses three questions: 1) How does Dutch society perceive farm animal welfare? 2) Which elements constitute societal perception of farm animal welfare? 3) Through which interventions can societal perception of farm animal welfare be affected?

4.2 Conceptual framework

4.2.1 Perception

People differ in their perception of reality (Jager and Mok 1999). This is true for reality in general, but also for the perception of issues such as the welfare of farm animals. How people perceive reality depends on their frame of reference, which can be defined in many ways depending on the purpose of use (Dewulf *et al.* 2005). For example, Aarts and Van Woerkum (1994) distinguish values and norms, convictions, experiences, and interests as separate elements of a frame of reference. In the present study we differentiate between four elements that together contribute to a frame of reference (Figure 4.1). The first element concerns *Convictions and Values*. Convictions are generally accepted basic truths, which are not easily questioned and which are closely related to values (Aarts and Van Woerkum 1994). We discuss values in more detail in section 4.2.2. Considering a second element, *Interests* are

part of a frame of reference, but not included in the analysis. This is in accordance with Jager and Mok (1999) who emphasise that people derive their frame of reference by individual experiences in life and do not appoint 'interests' as a specific element of frame of reference. Taking into account that few people have an interest in agriculture (and animal welfare) nowadays, we followed Jager and Mok and left interests out of further consideration. The third and fourth elements concern experiences, which we distinguished into two types, i.e.: experiences through reading or hearing information, so-called *Factual knowledge* and experiences through real life contact with farms and animals, so-called *Emotional experiences*. Emotional experiences with animals are influenced by real life contact with farm animals as well as by real life contact with pets.

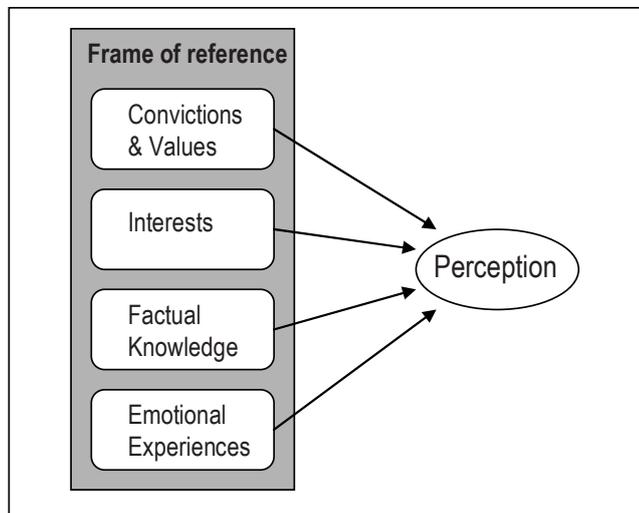


Figure 4.1 Influence of four elements of frame of reference on perception (adapted from Aarts and Van Woerkum 1994)

Former research demonstrated that perception is most likely and most easily to be influenced by provision of factual knowledge and emotional experiences, whereas values and convictions are more difficult to influence (Aarts and Te Velde 2001). This is in line with the fact that values and convictions are culturally defined and once a person has established certain pattern in values (around the age of ten to twelve years) this pattern needs to be unlearned before a person can establish a new pattern (Hofstede and Hofstede 2005).

4.2.2 Value orientations

Research on values and convictions in societies is carried out for many years (Rokeach 1973, Schwartz and Bilsky 1987). Rokeach (1973) defines a value as "an enduring belief that a specific mode of conduct

or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence". Values are not directly observable and expressive at individual level. However, it is possible to ask people to rank values according to level of importance, for example with Rokeach Value Survey (Rokeach 1973). A set of ranked values forms a cluster of values into a so-called value-domain or *value orientation*. At societal level, different value orientations can be distinguished. Ranking order of values is culturally defined and therefore the exact composition of value-domains may differ per society (Schwartz and Bilsky 1990).

For the present study we needed a model that is appropriate to Dutch society. In the literature we found several models, e.g.: Oppenhuisen (2000) defined 160 values divided across six dimensions; the 'Mentality'-model distinguishes eight social environments (Motivaction 2002); 'Value Box' (Trendbox 2004) and the 'WIN-model' (Hessing-Couvret and Reuling 2002) distinguish different value orientations. We used the WIN-model of TSN NIPO (The Dutch Institute for Public Opinion and Market Research), because we were able to use a dataset which included respondents' WIN-orientations. The WIN-model distinguishes eight value orientations (Table 4.1) which are theoretically based on Rokeach's values, Schwartz and Bilsky's domains, and Oppenhuisen's dimensions (Hessing-Couvret and Reuling 2002).

Table 4.1 Eight value orientations according to the WIN-model, including important Rokeach's values (adapted from Mulder 2003)

Value orientation	Rokeach's (1973) values
1. The Caring faithful	A world of peace, Equality, National security, Salvation, Helpful, Forgiving, Honest
2. Conservatives	Family security, Clean, Loving, Obedient, Polite
3. Hedonists	Pleasure, Ambitious, Cheerful, Family security
4. Materialists	A comfortable life, An exiting life, Mature Love, Ambitious, Social recognition, Happiness
5. Professionals	Capable, Courageous, A sense of accomplishment, Independent, Intellectual, Logical, An exiting life
6. Broad-minded	Freedom, Imaginative, Wisdom, Broadminded, Inner Harmony, Intellectual
7. Socially minded	Equality, Inner Harmony, A world of beauty
8. The Balanced	Middle group, no remarkable values

The WIN-model is based on two axes: conservation vs. progression and 'focus on him/herself' vs. 'focus on others'. Three variables (age, gender, education) are to some extent confounded with value orientations as illustrated in figure 4.2 (Hessing-Couvret and Reuling 2002).

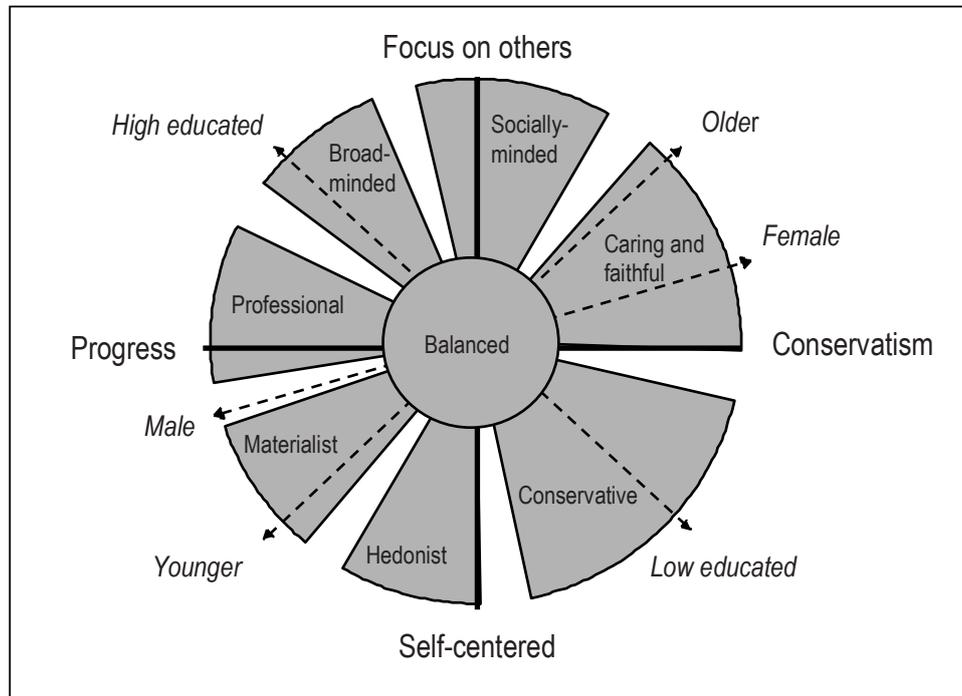


Figure 4.2 The WIN-model: eight value orientations in the Netherlands and three variables (age, gender and educational level) (adapted from Hessing-Couvret and Reuling 2002)

4.3 Materials and Methods

4.3.1 Data selection

For the present study the dataset of the Rathenau Institute was selected, which concerned 'Citizens' perception of handling animals in livestock production systems' (*'Burgeroordelen over de omgang met dieren in de veehouderij'*) (Verhue and Verzijden 2003). In 2003, 1074 randomly selected Dutch respondents of the 'TNS NIPO CAPI@HOME'-database filled in a questionnaire on perception of animal welfare. The dataset included variables such as gender, educational level, age, value orientation, possession of a companion animal (pet ownership), connection to agriculture and area of living (urbanisation degree). Of these 1074 respondents, 842 again randomly selected respondents received a leaflet with information on livestock production and farm animal welfare enclosed with the questionnaire. The leaflet contained information from three perspectives: a scientific perspective, farmers' perspective and the perspective of the Dutch animal protection organisation. As perceptions are not directly observable and measurable (Rosenberg *et al.* 1960), perceptions were measured indirectly with 21 propositions on a 4-point Likert-scale (1: I agree completely, 4: I disagree completely). The dataset did not contain missing values, because the questionnaire had to be filled in completely in

order to receive the arranged financial compensation. Apart from score 1 to 4, respondents could answer 'don't know' (score 0), which could be caused by a lack of knowledge or by the absence of an opinion about the topic. Due to this indistinctness and because the dataset did not contain actual missing values, we recoded 'don't know' as missing values for further analyses.

4.3.2 Statistical analyses

Statistical analyses (with SPSS 12.0.1) consisted of two steps. Firstly, we performed factor analysis of propositions on livestock production and farm animal welfare. The selected propositions were part of a questionnaire that consisted of four parts. The first part contained propositions on perception of animal welfare and production systems in general. The second part contained sector specific questions in different types (e.g. ranking). The third part contained respondents' background information such as relation to agriculture and pet ownership. The fourth part contained questions about different sustainability issues. The focus of the present paper is on animal welfare and therefore we analysed the first part, which included 21 propositions about farm animal welfare and the third part. Based on several criteria we excluded six propositions from factor analysis. Deleted propositions were either multi-interpretable, or had low communalities (< 0.4), or loaded relatively high on two or more factors (Field 2000). Final factor analysis contained 15 propositions. For each factor we performed a reliability analysis and an adequacy test with Kaiser-Meyer-Olkin Measure (Field 2000). To interpret factors more clearly, we applied oblique rotation, although factors can become correlated (SAS Institute Inc. 1999). We renamed each factor and saved it as a new variable. We checked factors for normal distribution on skewness and kurtosis.

Secondly, we used a statistical model to analyse variation in perception per factor in relation to individual characteristics. Five individual characteristics are included as explanatory variables in the full model.

$$Y_{ijklmn} = \mu + A_i + B_j + C_k + D_l + E_m + e_{ijklmn}$$

Y_{ijklmn}	=	Factor y
μ	=	Mean
A_i	=	Value orientation ($i = 1, \dots, 8$)
B_j	=	Pet ownership ($j = 0, 1$)
C_k	=	Urbanisation degree ($k = 1, \dots, 5$)
D_l	=	Connection to agriculture ($l = 1, 0$)
E_m	=	Leaflet information ($m = 1, 0$)
e_{ijklmn}	=	Error

If factors were normally distributed, we searched for significant main effects of variables on each factor through ANOVA and, after Levene's test for homogeneity, we used Gabriel's Post-Hoc tests. If factors had non-normal distributions we performed Kruskal-Wallis nonparametric tests.

4.4 Results

4.4.1 Four factors

We included factors with an eigenvalue above 1.0 (Field 2000), resulting in four factors that explained 66.5% of total variance (Table 4.2). The factors fulfilled required statistical criteria (according to Field 2000), because average communality was above 0.60 (0.66), Kaiser-Meyer-Olkin Measure was above 0.5 (0.89), Barlett's Test was significant ($P < 0.01$) and for each factor Cronbach Alpha was above 0.7 (Table 4.2).

Table 4.2 Factor loadings of 15 propositions on 4 factors, including percentage variance explained and Cronbach Alpha

	Most important factors ^a			
	1	2	3	4
<i>Propositions</i>				
Most farmers focus too much on management instead of their animals	-0.86	-0.02	0.04	-0.01
Most farmers consider their animals too much as means of production	-0.83	-0.04	0.04	0.02
Most farmers solely treat animals properly as long as it is financially beneficial	-0.79	-0.01	-0.01	0.06
Most farmers economize on animal welfare	-0.70	-0.01	-0.11	-0.06
Most farmers are actually not interested in animals	-0.59	0.06	-0.18	-0.18
Human life is of higher value than an animal life	0.01	0.89	-0.01	0.02
Humans are more important than animals	0.03	0.88	0.05	0.02
Animals on an average farms are better off than animals in nature	-0.10	0.06	0.83	-0.07
Animals on farms have quite a good life	-0.04	0.09	0.80	0.09
Most farmers give their animals a comfortable life	0.22	-0.04	0.71	0.01
Most farmers are animal lovers	0.34	-0.03	0.58	0.01
Most farmers are in daily contact with their animals	0.14	-0.09	0.53	0.14
Humans are allowed to use animals for consumption	-0.13	0.00	0.06	0.88
Humans have the right to use animals for consumption	0.11	0.07	-0.16	0.82
I don't feel guilty when I eat meat/fish	0.04	0.00	0.14	0.71
<i>Statistical criteria</i>				
Percent of total variance explained (%)	38.6	12.8	7.85	7.20
Cumulative percent of variance explained (%)	38.6	51.4	59.3	66.5
Eigenvalue (>1.0)	5.79	1.92	1.18	1.08
Cronbach Alpha (>0.70)	0.86	0.78	0.83	0.73

^a Factor loadings > 0.50 are in **bold**

The first factor describes respondents' perception of farmers, in other words '*Farmers' Image*' (FI). The propositions of this factor were negatively formulated, so the higher respondents scored on FI, the more they agreed that farmers are mainly focussed on the economic aspect of farming with little respect for

animal welfare. FI explained 38.6% of total variance and was normally distributed. The second factor describes 'Human-Animal Hierarchy' (HAH). Human-Animal Hierarchy added 12.8% to explanation of total variance and distribution was skew (0.81). The lower the score on HAH, the more respondents valued human life above animal life. The third factor describes perception of respondents of 'Life Quality of farm animals' (LQ). This factor is the actual indicator of how respondents perceived welfare of farm animals. The lower respondents scored on LQ, the better life quality of farm animals was perceived. LQ explained 7.8% of total variance and was normally distributed. The fourth factor describes 'use of animals for Human Consumption' (HC). The lower respondents scored on HC, the more respondents agreed that humans are allowed to use animals for consumption. HC explained 7.2% of total variance and distribution was skew (0.82).

Table 4.3 Descriptives of 15 propositions divided over four factors

Propositions per factor	Descriptives			
	Mean ^a	S.d.	<i>n</i>	DK ^b
<i>Farmers' Image (FI)</i>				
Most farmers focus too much on management instead of their animals	2.33	0.80	1,005	0.06
Most farmers consider their animals too much as means of production	2.07	0.79	1,042	0.03
Most farmers solely treat animals properly as long as it is financially beneficial	2.27	0.88	1,026	0.04
Most farmers economize on animal welfare	2.49	0.79	966	0.10
Most farmers are actually not interested in animals	3.08	0.81	1,026	0.04
<i>Human-Animal Hierarchy (HAH)</i>				
Human life is of higher value than an animal life	1.84	0.98	1,061	0.01
Humans are more important than animals	1.98	1.00	1,067	0.01
<i>Life Quality of farm animals (LQ)</i>				
Animals on an average farms are better off than animals in nature	2.57	0.79	1,006	0.06
Animals on farms have quite a good life	2.21	0.75	1,038	0.03
Most farmers give their animals a comfortable life	2.13	0.76	1,026	0.04
Most farmers are animal lovers	2.03	0.82	1,026	0.04
Most farmers are in daily contact with their animals	1.63	0.74	1,039	0.03
<i>Use of animals for Human Consumption (HC)</i>				
Humans are allowed to use animals for consumption	1.42	0.60	1,069	0.00
Humans have the right to use animals for consumption	1.72	0.79	1,063	0.01
I don't feel guilty when I eat meat/fish	1.84	0.95	1,068	0.01

^a Mean score on a 4-point Likert-scale (1 = I agree completely, 4 = I disagree completely)

^b DK: fraction of total respondents (N= 1074) answered 'Don't Know'

Perception of FI and LQ consisted both of five propositions and showed a wider range in mean scores than perception of HAH and HC (Table 4.3). LQ is the actual indicator for perception of farm animal welfare and the proposition 'Animals on farms have quite a good life', one of the main propositions of LQ, was perceived slightly positive (2.21). For FI, respondents slightly agreed (2.07) that farmers consider their animals too much as mean of production; however, respondents did not outspokenly

agree or disagree (2.33) that farmers focus too much on management instead of their animals. Concerning HAH, human life is generally valued above animal life (1.84) and of total propositions; respondents agreed most strongly on the HAH-proposition 'Humans are allowed to use animals for consumption' (1.42). Standard deviation was highest (0.98 and 1.00) for both HAH-propositions in comparison with other propositions. The fraction of respondents that answered 'Don't know' was higher for FI and LQ (0.03 - 0.10) than for HAH and HC (0.00 – 0.01).

4.4.2 Variation in perception

We analysed the contribution of five variables to variation in FI, HAH, LQ and HC (Table 4.4). In order to 'measure' values we used eight value orientations of the WIN-model (section 4.2.2). Pearson Chi-square confirmed significant confounding of variables gender, age and educational level with value orientations.

Table 4.4 Significance of contribution to variation of variables *A*, *B*, *C*, *D*, and *E* on factors FI, HAH, LQ, and HC

Variable		df	Factor ^a			
Code ^b	Name		FI ^c	HAH ^d	LQ ^e	HC ^d
<i>A_i</i>	Value orientation	7	ns ^e	ns	**	ns
<i>B_j</i>	Pet ownership	1	***	***	**	**
<i>C_k</i>	Urbanisation degree	4	ns	*	*	ns
<i>D_l</i>	Connection to agriculture	1	**	ns	***	*
<i>E_m</i>	Leaflet information	1	*	ns	ns	ns

^a Factor names: FI: Farmers' Image, HAH: Human-Animal-Hierarchy, LQ: Life Quality of farm animals, HC: use of animals for Human Consumption

^b Full model $Y = \mu + A_i + B_j + C_k + D_l + E_m + e_{ijklmn}$

^c Normally distributed: differences explained with ANOVA and Gabriel's Post Hoc test

^d Non-normally distributed: differences explained with nonparametric Kruskal-Wallis test

^e *** = $P < 0.001$, ** = $P < 0.01$, * = $P < 0.05$, ns = $P > 0.05$

Three variables had a significant effect on FI, i.e.: Pet ownership, Connection to agriculture and Leaflet information. Pet owners had a less positive image of farmers than respondents without a pet. Secondly, respondents with connection to agriculture had a more positive image of farmers than respondents without connection to agriculture. Thirdly, respondents with a leaflet had a more positive image of farmers than respondents without a leaflet.

Two variables had a significant effect on HAH, i.e.: Pet ownership and Urbanisation degree. Respondents without a pet value human life more than animal life, compared to pet owners. HAH consisted of two propositions and urbanisation degree showed a trend ($P < 0.10$) when both propositions were analysed separately. Respondents in highly urbanised areas ($> 2,500$ addresses/km²) value

human life less strongly above animal life compared to respondents in urbanised areas (1,500 - 2,500 addresses/km²).

Four variables had a significant effect on LQ, i.e.: Value orientation, Pet ownership, Urbanisation degree, and Connection to agriculture. Broad-minded and Professionals perceived the life quality of farm animals as being less positive than The Caring Faithful and Conservatives. Secondly, pet owners perceived the life quality of farm animals as being less positive than respondents without a pet. Thirdly, urbanisation degree had five categories (1= highly urbanised, 2 = urbanised, 3= moderately urbanised, 4 = slightly urbanised, 5 = non-urbanised). Respondents in non-urbanised areas (<500 addresses/km²) perceived the life quality of farm animals as being more positive than respondents in highly urbanised and urbanised areas (>1,500 addresses/km²). Fourthly, respondents with connection to agriculture perceived life the quality of farm animals as being more positive than respondents without connection to agriculture.

Two variables had a significant effect on HC, i.e.: Pet ownership and Connection to agriculture. Respondents without a pet agreed more strongly that humans are allowed to use animals for consumption than pet owners. Respondents with connection to agriculture agreed more strongly that humans are allowed to use animals for consumption than respondents without connection to agriculture.

4.5 Discussion

4.5.1 Average societal perception

In general, Dutch society perceived the life quality of farm animals as slightly positive, because Likert scale scores (1 to 4 with median 2.5) of the five propositions of the actual indicator for animal welfare (factor LQ) had a range from 1.63 to 2.57 (Table 4.3). At the same time, most respondents slightly agreed that most farmers consider their animals too much as mean of production, but many of them do think that this image is in conflict with the perception that farmers care about animal welfare too. The relatively high fractions of respondents answering 'don't know' to Farmers' Image and Life Quality of farm animals, seems to indicate that people either do not have an opinion or that people have a lack of knowledge about these elements. This is in line with the result that Farmers' Image is mainly determined by factual knowledge (section 4.5.3).

4.5.2 Variation in societal perception

To explain why perception may differ, we used the theoretical framework (referred to in section 4.2) and

we appointed three elements of perception i.e.: Convictions and Values, Emotional Experiences and Factual knowledge (Figure 4.1) to the four factors that we derived from our dataset. Each of the factors found in this study contains aspects of these elements. Significant contributors to *Human-Animal Hierarchy* were in the domain of emotional experiences (pet ownership). Significant contributors to *Use of animals for human consumption* were in the domain of emotional experience (pet ownership and connection to agriculture). Significant contributors to *Life Quality of farm animals* were in the domain of values (value orientation) and emotional experiences (combination of pet ownership, urbanisation degree and connection to agriculture). Significant contributors to *Farmers' image* were in the domain of factual knowledge (connection to agriculture and leaflet information) and emotional experiences (connection to agriculture and pet ownership).

Looking more closely into the factors HAH and HC, we may conclude that both of them are mainly based on emotional experiences (pet ownership and connection to agriculture). We may also conclude that convictions play an important role in both factors, taking the nature of propositions on which these factors were based, into account. This in line with Aarts and Te Velde (2001), who described that Dutch society generally accepts to use animals for consumption and to value human life more than animal life.

The results of the present paper are derived from Dutch society and international research showed that perception of animal welfare is also an issue in other (European) societies (e.g. Burgess and Hutchinson 2005, Eurobarometer 2005.). Harper and Henson (2001) conducted studies in France, Germany, Ireland, Italy and the United Kingdom and reported that people believed it was right to eat animal products and that people are concerned about animal welfare. However, this study related perception of animal welfare directly to purchase behaviour of animal products and not to other aspects such as values. We expect that the factors in the present paper can also be distinguished for other societies, although to which extend is unclear.

4.5.3 Intervention possibilities

The perception elements *Convictions and Values* are closely related to each other and in the present study we considered the factors HAH and HC as convictions in Dutch society. Factor LQ (the actual indicator for perception of farm animal welfare) is the only factor significantly influenced by values (value orientations as descriptor). And although convictions and values are not easily affected, it is important to be aware of these deeper and relative stable layers of perception when intervening at other elements of societal perception.

The perception element *Emotional Experiences with animals* (pet ownership as descriptor) is important for all factors. The conclusion seems justified that emotional experience and especially the experience of owning a pet is an important contributor to the perception of farm animal welfare. The possession of a pet even affected Farmers' Image and convictions (HAH and HC), which was not expected in our theoretical framework. To explain human-animal attitudes we use Serpell's model (2004), in which he describes a controversy between the two primary motivational dimensions 'Affect' (emotional responses to animals) and 'Utility' (perceptions of animals' instrumental value) as possible cause for many tensions and paradoxes in human-animal relationships. This model helps to clarify the results of the present study, in which pet owners did not agree as strongly as people without a pet that humans are allowed to use animals for human consumption and that human life is valued above animal life. When considering the fact that pet owners base their perception of farm animals mainly on affection with their pets, this dimension of affection for farm animals is in conflict with the utility purpose of farm animals i.e. production for human consumption. The described controversy also helps to explain the less positive perception of Farmers' Image of pet owners compared to people without a pet. It seems plausible that farmers are considered as people with a human-animal relationship based on utilization purposes, instead of affection. And as for pet owners the utilization purpose is perceived to be in conflict with the dimension of affection, hence pet owners perceive farmers as people who cannot care about their animals in an affective way.

The perception element *Emotional Experiences with farming* (urbanisation degree and connection to agriculture as descriptor) strongly affected how the life quality of farm animals is perceived. People in rural areas and/or with relation to agriculture perceive the life quality of farm animals as more positively. These findings show the importance of emotional experiences with farming through real life contact with farms. People can gain real life contact with farms through farm visits. It is interesting to cite the author of the European study 'Attitudes of consumers towards the welfare of farmed animals', that "visits to farms seem to increase the awareness and concern for animal welfare" (Eurobarometer 2005), which implies that experience with farmers and farm animals might be another emotional experience affecting one's perception of animal welfare. The Norwegian project 'The Farm as a Pedagogical Resource' is another interesting example. It demonstrates that school children visiting farms as part of their education achieve a greater understanding of the processes in nature and farming (Jolly *et al.* 2004).

The perception element *Factual Knowledge* (leaflet information as descriptor) contributed significantly to Farmers' Image only. This corresponds with the idea of farmers who repeatedly point at the lack of knowledge and real understanding of what farming entails and how farm animals live. Factual

knowledge is more susceptible to change than convictions, values or emotional experiences (Aarts and Te Velde 2001). Hence, Farmers' Image could be influenced by means of a leaflet or television program. This is interesting as through information supply, people can understand that farmers can consider their animals as means of production but care about animal welfare as well.

4.6 Conclusion

The average perception of farm animal welfare is slightly positive in Dutch society. The present study showed four important factors of societal perception of animal welfare. First and second factors, *Human-Animal Hierarchy* and *Use of animals for consumption* are mainly influenced by emotional experiences. The third factor *Life Quality of farm animals* (the actual animal welfare indicator) is strongly influenced by values and emotional experiences. These experiences not only include experiences with farm animals, also experiences with pets strongly influenced the perception of farm animal welfare, as pet owners perceived farm animal welfare as being less positive than people without a pet. Moreover, people with farm experiences perceived animal welfare as being more positive. These findings are of importance since nowadays many people have a pet and the number of people with farm experiences is decreasing in Dutch society. In terms of intervention, these findings show the importance of emotional experiences with farming through real life contact with farming and farm animals (e.g. through farm visits and experiences at young age). The fourth factor *Farmers' Image* is the only factor that was, besides emotional experiences, also affected by factual knowledge. In terms of intervention, this means that farmers' image can be influenced by information supply (e.g. through a leaflet), whereas perception on life quality of farm animals is not directly influenced through information supply.

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"The Netherlands is becoming too full and over-urbanized. The countryside has to stay as it is, as a counterweight to progressing urbanization." - NL

"For me dairy farming is part of Dutch culture: Dutch cattle in the pasture, black-pied in the north and red-pied in the south, has defined the Dutch landscape through the years. Also Dutch cheese is famous all over the world." - NL



"Dairy farming has a hundred-year-long tradition in Norwegian cultural life and for me Norway without dairy production is unthinkable." - NO

"This picture is most valuable to me because it is important that the growth of forest and bushes is restricted. At the same time the cows are able to graze in the open landscape." - NO

Chapter five

Sustainability as a socio-cultural concept: citizen panels visiting dairy farms in the Netherlands

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Abstract

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Acknowledgements

Abstract

The important role of values is very evident when it comes to citizens' concept of sustainability. The present paper had the objective to define sustainability as a socio-cultural concept for livestock production systems. The main research question was: how do Dutch citizens value various aspects of dairy production systems? We conducted farm visits with citizens panels in the Netherlands. We asked citizens about their on-farm perception (smelling, hearing, seeing and feeling) and what they perceived valuable to preserve for the future. We presented sustainability as a socio-cultural concept which included citizens' valuable aspects (SCA) and concerns (SCI). We defined a socio-cultural aspect (SCA) as an aspect of a livestock production system, which is mentioned by society as being valuable to preserve for the future. We identified a SCA as a socio-cultural issue (SCI) when it evokes societal concern in present time or is expected to do so in the future. By qualitative analysis we identified SCA's and SCI's of dairy production systems and combined these into socio-cultural themes (SCT). We found ten socio-cultural themes which contained 42 socio-cultural aspects (SCA), of which 27 were identified as socio-cultural issues (SCI). We can conclude that livestock production systems have more values for society than solely food production, because only one of the ten identified socio-cultural themes directly concerned food production (SCT 1), whereas the nine other themes concerned values that go beyond food production: farming activities (SCT 2), farm income (SCT 3), animals (SCT 4), landscape (SCT 5), nature (SCT 6), environment (SCT 7), farming culture (SCT 8), national culture (SCT 9) and services for society (SCT 10). One of the main values of agriculture seems the combination of apparently contradicting aspects such as technology and nature within one system. In conclusion, sustainability as a socio-cultural concept for livestock production systems is defined by a wide range of socio-cultural aspects and issues, reflecting citizens' values and concerns of that system and for a sustainable agriculture it is important that both SCI's and SCA's are taken into account.

Keywords: Dairy production, Society, Culture, Values, Issues, Farm visits.

5.1 Introduction

5.1.1 Dimensions of agricultural sustainability

Sustainability is a confusing and contested concept. It is defined in many different ways reflecting varying concerns and ambitions. Depending on which dimension one wants to focus, the economic, ecologic or social one, different attributes are used to describe agricultural sustainability (Farshad and Zinck 1993). Some authors refer to the ecological dimension of sustainability in the sense of non-depletion of natural resources, e.g. Reijnders and Huijbregts (2005) and Payraudeau and Van der Werf (2005). The latter stated that “from the environmental point of view, a farming activity is sustainable if its pollution emissions and its use of natural resources can be supported in the long term by the natural environment”. Others place economics at the core of sustainable agriculture and refer to economic considerations, such as profitability, efficiency and productivity (James 2006). Still others refer to social objectives such as “sustaining farm families, finding ways to resist the depopulation of medium sized farms and rural communities” (Thompson 1992). The social dimension often includes topics such as farm labour and working conditions (e.g. Shreck *et al.* 2006). Finally, several authors combine the three dimensions of agricultural sustainability into one sustainability framework or index (e.g. Van Calker *et al.* 2005, Van Cauwenbergh *et al.* 2007).

Simultaneously, agricultural sustainability is related to divergent interests and socio-political goals (Thompson 1992), the dominance of particular paradigms (Dahlberg, 1988) and “deep differences in values” (Sumner 2005). In other words, the concept of agricultural sustainability is value-loaded in the sense that no dimension or definition is neutral, as objective and scientific as it may seem (Sumner 2005). In addition, values can change over time (Inglehart 1977). This fits into Dahlberg’s (1988) approach who underlined the time- and space dependency in agricultural research and their related definitions of sustainability.

5.1.2 Values of agriculture

Although none of the dimensions of sustainability may be considered as value-free, the important conceptual role of values is the most evident when it comes to social sustainability, because values are part of the identity of society and its members, divergent and conflicting as they can be (Vinken and Soeters 2004). Likewise the concept of sustainability, the concept of values is rather vague and can be described in many different ways and at different levels. Often, values are placed at the core of culture (Inglehart 1977, Hofstede 1980, Schwartz 1999). Schwartz (1999: p43) described values as “criteria people use to select and justify actions and to evaluate people and events”. This definition is still rather

vague, however, if we place an agricultural system in this definition, it becomes clearer. Consequently, a value of an agricultural system can be described as an aspect that people, i.e. citizens, use to evaluate that system. Relating this to the concept of sustainability, this can be described as a citizens' concept of sustainability. This concept is similar to Thompson's (1992) goal-describing concept of sustainability, which refers to ethically significant goals of a system, in other words "an agriculture that meets our goals as a society". Nowadays, societal goals go beyond food production, or as Hodges (2006) described: "the changing culture of Western society is now embracing values beyond cheap food". In conclusion, the definition of agricultural sustainability is influenced by societal values and consequently can change over time. Considering the fact that values form the core of a culture, we defined citizens' perception of sustainability as a *socio-cultural concept* of sustainability. The objective of the present study was to define sustainability as a socio-cultural concept for livestock production systems. The present paper focused on dairy production systems in the Netherlands, which lead to the following research question: How do Dutch citizens value various aspects of dairy production systems?

5.1.3 Sustainability as a socio-cultural concept

In search for values of livestock production systems we first searched for socio-cultural aspects (SCA) of a livestock production system. We defined a socio-cultural aspect (SCA) as an aspect of a livestock production system which is mentioned by society as being valuable to preserve for the future. Subsequently, we grouped socio-cultural aspects (SCA) into themes that cover a common topic of a production system (e.g. farm activities or food production), i.e. a socio-cultural theme (SCT). However, sustainability is not only expressed through valuable aspects of a system but also through concerns. Cornelissen *et al.* (2001) described that "agricultural sustainability invokes *concern* that [...] current agricultural activities might endanger the continuity" and that "this *concern* is expressed through *issues*". Thus secondly, we searched for socio-cultural issues (SCI) of a livestock production system. In line with the description of Cornelissen *et al.* (2001), we defined a socio-cultural issue (SCI) as a socio-cultural aspect that evokes societal concern in present time or is expected to do so in the future. A SCI can originate in two ways: (1) there is a negative societal perception of a SCA at present time, or (2) there is societal concern about a SCA with regard to developments in the future (Figure 5.1). A well-known example of a socio-cultural issue is animal welfare; this aspect of a livestock production system raised societal concern already many years ago. In addition McGlone (2001) mentioned several other issues such as environmental concerns, food safety and worker health.

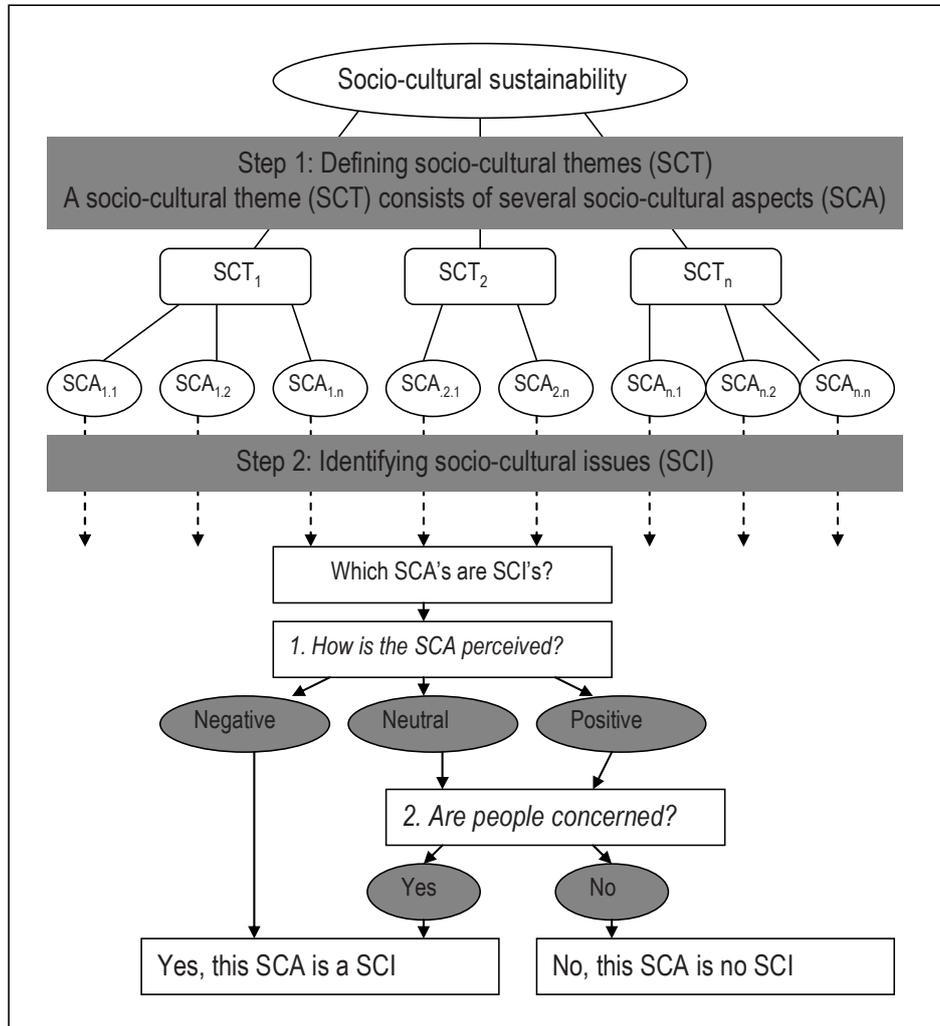


Figure 5.1 A two-step approach to define sustainability as a socio-cultural concept

5.1.4 Measuring values

In the present study we are interested in societal values of dairy production systems. When we want to identify or 'measure' values we face two difficulties. Firstly, values are implicit, which means that people are unaware of their individual values (Rokeach 1973). Consequently, the challenge with gaining insight into societal values is to make the implicit explicit. In order to do so, several quantitative methods exist, for example value-surveys (Rokeach 1973, Schwartz and Bilsky 1990). Jackson (1989) describes a more qualitative approach in which "lived experiences", for example actions, events or stories, can bring values to the surface and make them more explicit.

Secondly, values are part of people's frame of reference (Te Velde *et al.* 2002). Besides values, a frame of reference is also influenced by factual knowledge and emotional experiences (Boogaard *et al.* 2006). However, most Dutch citizens have neither experience with nor knowledge about agriculture (Aarts and Hanning 2001), thus in order to collect data about citizens' concept of sustainable agriculture it is necessary to take people to farms to give a realistic impression about what farming actually entails. Consequently, we conducted farm visits with citizen panels to deal with both difficulties at the same time; 1) a farm visit can be seen as a "lived experience" which can bring values to the surface and 2) citizens gained knowledge and experience about farming.

5.2 Method

The experimental design of the study was as follows: We conducted a pilot study in one region (Zuid-Holland), in which one citizen panel visited two dairy farms on one day. This pilot study was followed by the main study which we conducted in three regions (the provinces Zuid-Holland, Noord-Brabant and Friesland) with two dairy farms per region. In each region two citizens panels visited both dairy farms. Further clarification about composition of the panels and selection of the farms will be given in section 5.2.2.

5.2.1 Farm visits

A farm visit started with an introduction by the farmer about his or her farm. After a walk around the farm and through the landscape, each respondent individually filled out the questionnaire. On farm citizens perceived a dairy farm in reality, which included different types of sensory information, e.g. smells, sounds and visualisations (Krogh 1995). The on-farm questionnaire contained the following questions: 1) What do you smell? 2) What do you hear? 3) What do you see? 4) What do you feel? These questions included a motivation whether the perception was positive, negative or neutral. In addition to the third question ("What do you see?"), each respondent received a digital camera and was requested to record 10 pictures per farm that represented valuable aspects to preserve for the future. One week after the farm visits, respondents received their individual printed pictures by mail and were asked to select five pictures of each farm that represented the most valuable aspects and to motivate why exactly the selected aspect was valuable to preserve for the future.

In February 2005 we conducted a pilot study in Zuid-Holland, a province in the Netherlands. The purpose of this study was to test whether the developed method was suitable to identify socio-cultural issues. Two weeks after the farm visits, respondents were individually interviewed in a face-to-face interview in order to gain insight in respondents' motivation for the selected pictures. However, the

individual interviews took too much time in comparison with the added value of the information. Therefore, we decided to replace the face-to-face interviews by a digital questionnaire, conducted through the electronic survey-system of the Dutch institute for public opinion (NIPO). The method appeared to be suitable for further use, consequently the structure of the farm visits and the questionnaires were maintained.

In the main study six farms participated, i.e. two farms per region. Farms were selected on base of the criteria that a farm should be representative for an average Dutch dairy farm (Table 5.1). However, variation between farms was desirable to show the public different types of average farms. In order to show this variation, one farm in every region was actively involved in nature or landscape conservation.

Table 5.1 Characteristics of six participating dairy farms

Farm characteristics	The Netherlands	Six participating farms			
	Average ^a	Average	Min	Max	S.D.
Land area (ha)	41	61	37	110	26
Dairy cows (#)	65	102	50	200	54
Milk production per cow (kg/year)	7700	7958	6000	8500	964
Milk production per farm (ton/year)	500	800	420	1600	439

^aSource: Farm Accountancy Data Network 2005 (LEI 2007)

5.2.2 Citizen panels

One panel (eight respondents) visited two dairy farms on one day. Each respondent received a financial compensation to ensure that not only people with particular interest in (dairy) farming would join. Respondents of the pilot study were selected via family and friends in the area on base of several criteria such as gender, age, urbanisation degree and educational level. For the main experiment, respondents were selected from a database including 200,000 Dutch citizens ("Capi@home"-database of NIPO, the Dutch institute for public opinion). Selection criteria should be representative for Dutch society and included age, gender, educational level, urbanisation degree and value-orientation (Table 5.2). Value-orientation is a priority in the ranking of individual values (Schwartz 1999). Hessing-Couvert and Reuling (2002) defined eight value-orientations for Dutch society, i.e. 'WIN'-orientations ('Warden In Nederland' (Values In the Netherlands)). In the present study each WIN-orientation was represented in each panel. Concerning urbanisation degree, we intentionally selected 50% of the respondents from rural areas and 50% from urbanised areas for each panel within a radius of 60 km around the farms. In total 39 citizens participated (one person cancelled) and most criteria were met (Table 5.2).

Table 5.2 Selection criteria of five citizen panels in three regions in the Netherlands

Region	Friesland	Noord-Brabant	Zuid-Holland	Total	
Selection criteria				(intended^a)	
Citizens (#)	16	15	8 ^b	39	(40)
Age (average years)	48	49	36	46	^c
Gender (% female)	50	40	63	49	(50)
Urbanisation (% living in urbanised areas ^d)	50	47	63	51	(50)
Educational level (% higher educated ^e)	32	40	38	36	(17 ^f)
Value-orientation (% of all 8 categories)	81	81	100	85	(100)

^a Number between () is the intended number based on experimental design

^b Data of pilot study excluded

^c min = 18, max = 75, s.d. = 15, which is in accordance with the desired composition.

^d > 1,000 addresses per km²

^e Bachelor degree or higher

^f Average % higher educated people in the Netherlands, Source: Statline 2005 (CBS 2007b)

In the spring and autumn of 2005, we conducted 12 farm visits distributed over three regions of the Netherlands (the provinces of Friesland, Noord-Brabant and Zuid-Holland). We selected these three regions, because they represent a geographic distribution in the Netherlands and the regions differ in urbanisation degree. The latter means that the urbanisation degree increases from Friesland, a slightly urbanised region, to Noord-Brabant, a moderately urbanised region, to Zuid-Holland a highly urbanised region. Per region, the order of the visits was opposite for both panels so a possible farm-effect could be avoided. For example, when panel I visited farm A in the morning and farm B in the afternoon, then after two weeks panel II visited farm B in the morning and farm A in the afternoon (Table 5.3).

Table 5.3 Farm visits with six citizen panels (panel I – V and a pilot) at six dairy farms (A – F) in three regions

Region	Friesland		Noord-Brabant		Zuid-Holland	
	Farm	A	B	C	D	E
1 st visit	Panel I	Panel II	Panel III	Panel IV	Panel V	Pilot ^a
2 nd visit	Panel II	Panel I	Panel IV	Panel III	Pilot ^a	Panel V

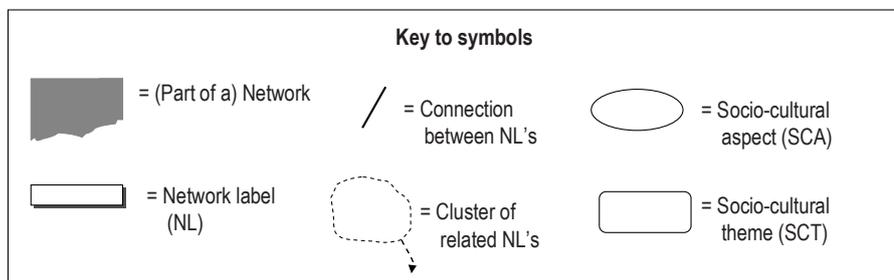
^a The results of the pilot study appeared to be useful and these results replaced one panel. Subsequently only five, instead of the planned six, citizen panels (I-V) were composed.

5.2.3 Data analysis

We combined the answers of each respondent in one text document, including all individual senses (smells, sounds, pictures and feelings) of that respondent. We analysed the data of the pilot study (including the text of the face-to-face interviews) by reading and marking the text in search for socio-cultural aspects and issues. For the data of the main experiment (panel I – V) we used the scientific software program ATLAS/ti 5.0 (2006) for qualitative data analysis. The analysis consisted of two steps: (1) Identifying socio-cultural aspects and grouping these into socio-cultural themes and (2) identifying socio-cultural issues.

In step 1 of the analysis we identified socio-cultural aspects and themes. In ATLAS.ti we first made a 'Hermeneutic Unit' (HU) in which we inserted the text document of a respondent as one 'Primary Document' (PD). Within each PD we coded respondents' quotations, according to topics and senses. The codes contained almost the exact terms as the respondent's words with the purpose to stay as close as possible to terms that citizens used concerning farming. Subsequently we inserted the codes of one respondent in a 'Network' of ATLAS.ti. A network is an instrument to visualise relationships between objects (e.g. codes) in the data (Evers and Boog 2001). In our analysis a network is a visualisation of all codes of one farm visit of a respondent, i.e. including all types of senses (smells, sounds, pictures, feelings). A code within a network is named a 'Network label' (NL). Each NL could be used once per network, therefore there were no identical NL's in one network. When a respondent associated two or more NL's with each other, we visualised this association with a direct line between these associated NL's. We tried to keep these connection lines as short as possible, which lead to the result that associated NL's, as indicated by the respondent, clustered together. In order to identify a cluster of NL's, we printed each network and manually circled each cluster. Such a cluster of NL's formed a socio-cultural aspect (SCA) and was named to a common aspect of a production system that the NL's covered. Finally, we grouped the SCA's that covered a common theme of a production system into one socio-cultural theme (SCT). Sometimes some overlap existed between two SCA's. For example, the network label 'Grazing cows' covered both the SCA 'Animal wellbeing' and the SCA 'Landscape aesthetics' (Figure 5.2).

In step 2 we identified socio-cultural issues (SCI) by answering two questions for each SCA (Figure 5.1), namely: (1) did the respondent perceive this SCA negatively? and (2) could the motivation of the respondent be interpreted as a concern? To answer these questions we analysed to the original the texts of the respondents in ATLAS.ti. Finally, we compared the identified SCA's and SCI's of the ATLAS.ti analyses with the analyses of the pilot study to justify the method of analyses. The SCA's and SCI's of both analyses appeared to be comparable.



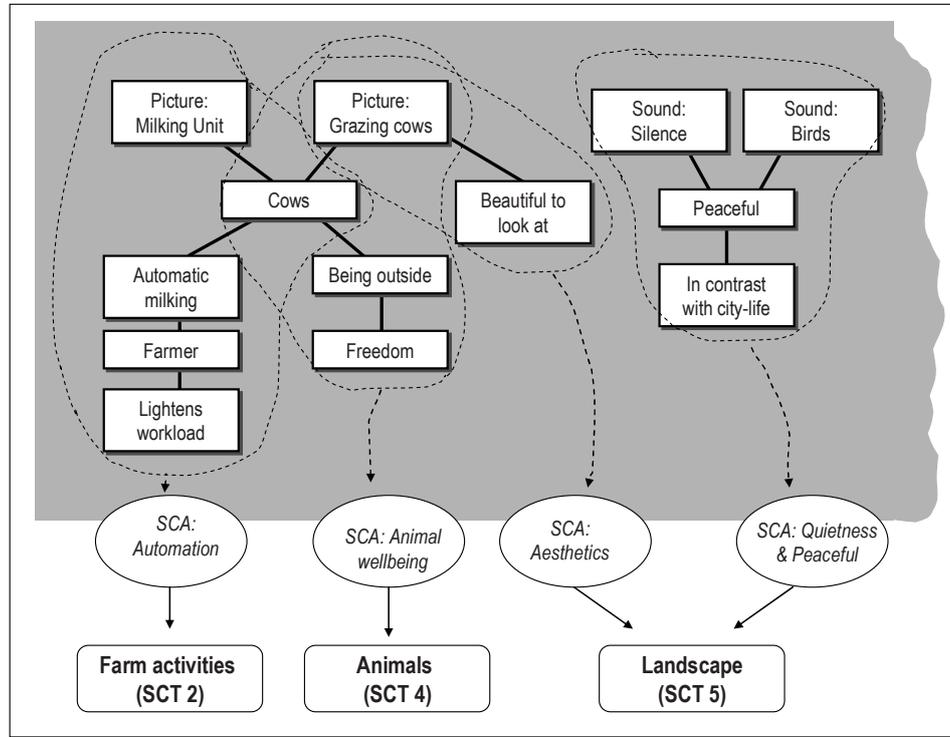


Figure 5.2 Part of a network to identify socio-cultural aspects (SCA) by clustering network labels (NL)

5.3 Results: ten socio-cultural themes including 27 socio-cultural issues

We made one network per respondent per farm visit, which resulted in 78 networks (39 respondents x 2 farm visits per respondent). In total, we identified 42 different socio-cultural aspects (SCA). We identified these 42 SCA's from the answers of all 39 respondents, however, none of the respondents mentioned *all* 42 SCA's, but each respondent emphasised different aspects. The 42 SCA's included 27 socio-cultural issues (SCI) (marked with * in Table 5.4), and could be grouped into ten socio-cultural themes (SCT) (Table 5.4). Below we discuss the ten identified socio-cultural themes (SCT), including 27 issues (SCI), illustrated with respondents' quotations. The number between brackets refers to the number in table 5.4.

Table 5.4 Socio-cultural themes, aspects and issues of dairy production systems according to Dutch citizens

Socio-cultural themes (SCT)	Socio-cultural aspects (SCA) (including 27 SCI's ^a)
1. Food production	1.1 Milk production, 1.2 Quality, 1.3 Hygiene*
2. Farm activities	2.1 Management, 2.2 Daily working activities, 2.3 Mechanisation*, 2.4 Automation*
3. Farm income	3.1 Financially profitable*, 3.2 Production costs, 3.3 Succession*
4. Animals (dairy cows)	4.1 Animal housing*, 4.2 Animal health, 4.3 Animal nutrition, 4.4 Animal wellbeing*, 4.5 Animal behaviour, 4.6 Animal breeding*, 4.7 Farmer-animal relation, 4.8 Separation of calf and dam*
5. Landscape	5.1 Farm yard (buildings and sheds), 5.2 Aesthetics*, 5.3 Open landscape*, 5.4 'Rust en ruimte' (Quiet and open space), 5.5. Silence*, 5.6 Fresh air*
6. Nature	6.1 Other farm animals* (sheep, chickens), 6.2 Wildlife* (birds), 6.3 Sides of ditches*
7. Environment	7.1 Environmentally friendly (e.g. waste water treatment)
8. Farming culture	8.1 Farm characteristics (e.g. animals sounds), 8.2 A way of living*, 8.3 The farmer*, 8.4 Family farm*, 8.5 'Gezelligheid' ('Cosy' ambiance)
9. National culture	9.1 Regional identity*, 9.2 Dutch culture*, 9.3 Part of national history, 9.4 Nostalgia, 9.5 Breed of the cattle*
10. Services	10.1 Counterweight to urbanisation*, 10.2 Human – farm interaction (education, recreation), 10.3 Landscape conservation*, 10.4 Nature (Wild life) conservation*

^aSocio-cultural aspects marked with * are identified as socio-cultural issues

5.3.1 Food production (SCT 1)

Regarding milk production, respondents were mainly concerned about hygiene (SCA 1.3). Respondents translated hygiene by evaluation of the cleanness and tidiness of the farm yard and sheds. Thus, when the farm yard and the sheds were clean, respondents perceived hygiene positive. On the other hand, when the farm yard was messy or untidy respondents perceived hygiene negatively, even when the milk shed was clean. In conclusion, many respondents associated a tidy farm yard with hygienic working practices in the milking shed, as illustrated with the quotation "No mud and manure everywhere, but a prim and proper farm yard. So, this paved yard indicates hygiene at the farm".

5.3.2 Farm activities (SCT 2)

In general, respondents associated farmers' working conditions with technological developments. In total 21 of the 39 respondents mentioned technological developments of which 14 were positive about the developments. Important arguments were that mechanisation (SCA 2.3) and automation (SCA 2.4) decreased the workload of the farmer and made farming activities more efficient, which gave the farmer time for other activities. *"The pocket pc is valuable, because it shows that the work of the farmer can be lightened with technological innovations"*. Moreover, respondents were enthusiastic about the innovative character of technological solutions like a concentrate box, automated calf feeding, automatic milking system and computerised data recording. However, seven of the 21 respondents were negative or showed their concern about future developments and said that although technological developments are necessary and can not be stopped, these should not only focus on production purposes: *"I was surprised about the use of modern technologies, everything was controlled with a very strong focus on milk production, but enough is enough"*.

5.3.3 Farm income (SCT 3)

Regarding economic issues, biggest concern of respondents was the fact that in the future it might be difficult (or even impossible) for farmers to earn sufficient income for farm continuation. This concern was expressed in two ways. Firstly, the level of income might not be in proportion with the amount of work and type of activities, which was considered unfair (SCA 3.1). And secondly, respondents were concerned about difficulties with farm succession (SCA 3.3).

5.3.4 Animals (SCT 4)

All 39 respondents mentioned 'the animals' (cows, calves or bulls) as valuable aspects. Thirty four of the 39 respondents mentioned topics related to animal housing (SCA 4.1). The cubicle stall was perceived positively, not only because of the fact that cows had enough space to move, but also because of technological innovations such as cow mattresses, back-scratchers and concentrate feeders. It could be postulated that such innovations are copies of natural situations, which therefore increased animal wellbeing. However, respondents were concerned about decreased freedom for dairy cows to graze in the pasture, considering the fact that more and more cows are kept inside whole year round. Housing of calves was sometimes perceived negatively, because calves did not have enough space to move around, which was related to animal wellbeing. Animal wellbeing (SCA 4.4) was frequently described with *"the freedom to move, eat, drink and rest where and whenever they want"* and *"satisfied and calm animals"*. Regarding animal breeding (SCA 4.6), respondents were concerned about the fact that most cows were artificially inseminated instead of naturally mated. Respondents gave several arguments of

which the most important one was the fact that AI is not 'natural': "*The bull at the farm was valuable, because cows can have natural mating instead of only artificial insemination*". Another SCA in which 'naturalness' was also issue, was the separation of calf and dam (SCA 4.8), because naturally a calf should grow up with 'the mother'.

Summarizing, it seems justified to conclude that many of the issues related to animals concern animals' naturalness. Several issues, such as calf-dam separation and artificial insemination were considered as sacrifices of animals' naturalness for production purposes. This seemed acceptable as long as there are only very few of these issues. However, if the level of naturalness is affected too much, people might disapprove the production system as a whole. "*I felt powerless to see the calves without their mothers, but if we want milk to satisfy our needs that's the way it is.*"

5.3.5 Landscape (SCT 5) and Nature (SCT 6)

One of the issues concerning the countryside were the aesthetics of the landscape (SCA 5.2). Of the 39 respondents, 31 respondents took a picture of cows in the pasture and selected this picture as a valuable aspect of dairy farming, not only for aesthetic reasons of the landscape, but also for cultural reasons (SCA 9.2 and 9.5) and because grazing contributes to the animals' naturalness (SCA 4.1 – 4.5). Other values of the countryside were the value of an open landscape (SCA 5.3), silence (SCA 5.5), fresh air (SCA 5.6) and nature. 'Silence' also included sounds of birds and wind breezing through trees. Respondents described these values by the typical Dutch expression '*Rust en Ruimte*' ('Quiet and open space' SCA 5.4).

Respondents' concept of nature included farm animals like sheep, chickens and grazing cows (SCA 6.1), wildlife like birds (SCA 6.2) and flowering sides of ditches (SCA 6.3). The combination of landscape and nature aspects creates a peaceful atmosphere, which was perceived valuable as counterweight to 'stressed daily life' (SCA 10.1). "*The country air and little noise really calm you down*". In total, 38 of the 39 respondents mentioned that the countryside (including the animals, the landscape and the farmer) evokes a happy, cheerful or calming feeling. "*I feel happy. One day on a farm feels better than several weeks of holiday*". Moreover, respondents were concerned that these aspects might disappear in the (near) future. Therefore, respondents were very positive and enthusiastic about landscape and nature conservation (SCT 10.3 and 10.4).

5.3.6 Environment (SCT7)

A few respondents mentioned farmers treating waste water as a valuable aspect, which was associated

with the fact that farmers are environmentally friendly (SCA 7.1). However, respondents did not seem to be much concerned about environmental issues. This might be explained by the fact that it is difficult to identify environmental issues at the level of an individual farm. Moreover, respondents might assume that nowadays farmers take the environment into account.

5.3.7 Farming culture (SCT 8)

Through conversations with the farmer respondents realised that farming included more than 'just a job'; it is different from jobs outside agriculture; it is a way of living in which private life and working environment are combined (SCA 8.2). The fact that farmers work with animals and deal with birth and death every day is one of the characteristics that makes farming special. This issue was closely related to the farmer-animal relation (SCA 4.7). Respondents emphasised the importance of individual attention for animals, not only because a close contact is important for the animals (in terms of health and wellbeing), but also because the contact between a farmer and his animals is part of the joy of being a farmer (SCA 8.3).

In total, 31 of the 39 respondents mentioned 'the farmer' as a valuable aspect. The farmers' enthusiasm and motivation were main reasons for positive perceptions. *"I like the positive attitude of the farmer. He works wholeheartedly, is enthusiastic and is visibly enjoying his work"*. Many respondents mentioned that it was important for the future that farmers stay motivated and keep enjoying their work. Moreover, when people met farmers they experienced that farming is a complex job, and that *"farmers are not stupid anymore"*. Some respondents held the prejudice that nowadays farmers only care about production and they appeared positively surprised that farmers also respect other values (like the landscape, nature and animals). Besides, several respondents were concerned about the tradition of family farms in the Netherlands and family farm (SCA 8.4) was mentioned as a valuable characteristic of Dutch farming culture, in which the word 'family' refers to the core family, parents and children. Several respondents mentioned that a family farm represents 'gezelligheid', which is a typically Dutch word and is often translated as 'cosiness', but in fact it implies much more, such as enjoyable, sociable, comfortable and pleasant (SCA 8.5).

5.3.8 National culture (SCT 9)

Respondents mentioned that dairy farming contributed to national culture. Of the 39 respondents, 12 respondents spontaneously mentioned that dairy farming is an important part of regional and Dutch culture (SCA 9.1 and SCA 9.2). However, when respondents were asked specifically whether dairy farming is a part of Dutch national culture all 39 respondents agreed. This included 'the typical Dutch

landscape with grazing cows' (SCA 9.5) and 'Dutch cheese', which were almost considered as national symbols. Dairy farming was also considered as part of national history (SCA 9.3), which gave some respondents nostalgic feelings (SCA 9.4). *"This beautiful landscape with grazing cows is typically Dutch, it exists like this for ages."*

5.3.9 Services (SCT 10)

The countryside was not only considered as an important counterweight to urbanisation (SCA 10.1), but respondents were also positive about human-farm interaction (SCA 10.2), which included the relaxing effect of human-animal contact and the learning effect about what farming actually entails. Besides, respondents were very positive and enthusiastic about farmers' landscape and nature conservation (SCA 10.3 and 10.4), which showed that farmers deal with landscape and nature in a respected way. Moreover, respondents were not aware beforehand that farmers participated in landscape and nature conservation and several respondents were concerned whether the financial compensation for these activities would suffice and continue in the future.

In addition to we would like to remark that the present paper gives an overview of the identified socio-cultural aspects and issues. For respondents' pictures and quotations, we refer to the booklet *'Met burgers de boer op'* ('Farm visits with citizens' Boogaard 2006), which was made for the participating farmers.

5.4 Discussion

5.4.1 Socio-cultural issues

With regard to animals (SCT 4), Dutch citizens considered several aspects of dairy farming as harming animals' naturalness (SCA 4.6 and 4.8). These findings are in line with those presented by Lassen *et al.* (2006) who described that living a natural life is an important part of animal welfare in the laymen's perspective. Verhoog *et al.* (2007) described the term 'naturalness' as a basic respect for the intrinsic value of nature, which manifests itself in several ways, e.g. respecting the characteristic (species-specific) nature of living organisms.

In addition, Dutch citizens were concerned about a strong focus on production values and possible disappearance of other values such open landscape, silence, fresh air and *'Rust en Ruimte'* (SCI 5.3 – 5.6). Vereijken (2002) described such values as Openness, Quietness and Silence (OQS)-related landscape-functions of agriculture. Besides, Dutch citizens seem to associate the countryside with

nature (SCT 6), though, Van den Berg and Koole (2006) described this type of nature as 'managed nature' as a contrast to 'wild nature'. Furthermore, Dutch citizens considered dairy farming and dairy products as important contributors to national identity (SCT 9), which can be compared with famous Dutch tulips, wooden shoes and mills.

5.4.2 Sustainability as a socio-cultural concept

Hansen (1996) describes a subjectivity in defining sustainability to the goals and values of the analyst rather than to the agricultural system. In the present research we were in search for societal values and concerns about dairy production systems. Thus we did not directly ask citizens about their concept of sustainability. However, we asked them indirectly by assessing their on-farm perception (smelling, hearing, seeing, feeling) and by requesting them to take 10 pictures per farm of aspects, which they perceived valuable to preserve for the future. By applying this method, we made sure that respondents could mention every aspect of dairy production that they perceived valuable. We did not give a list of topics or themes in advance. The presented list of socio-cultural themes and aspects (Table 5.4) was composed after the first step of the analysis, in which we grouped these valuable aspects. In the second step of the analysis we interpreted citizens' motivation with the purpose to identify concerns, i.e. socio-cultural issues. This means that the second step of the analysis included a subjectivity of the authors by interpreting the data into sustainability as socio-cultural concept, which included societal values and concerns.

When we place our findings in context with other studies, we see that several of the socio-cultural issues (SCI) and themes (SCT) of the present study are identical with sustainability issues as defined by stakeholder groups and experts, for example: hygiene (SCT 1), farm income (SCT 3), farmers' working conditions (SCT 2), animal welfare (SCT 4) and the environment (SCT 7) (Van Calker *et al.* 2005). However, we found that citizens' concept of agricultural sustainability includes more themes, such as landscape (SCT 5), nature (SCT 6), farming culture (SCT 8), national culture (SCT 9) and services for society (SCT 10). In addition, citizens' concept of sustainability did not only include concerns (SCI), but also valuable aspects (SCA). If we relate these results to values of livestock production systems for society, we can conclude that livestock production systems have more values than solely food production; aspects such as respecting animals' naturalness, sufficient farm income, maintaining landscape and nature, contribution to national culture and services as counterweights to urbanisation were also mentioned as being valuable. These results are in line with Hogdes (2006), who stated that Western society is now embracing values beyond cheap food, and Thompson (2006) who described sustainable agriculture with societal goals beyond food production.

The present study was conducted in the Netherlands. However, on basis of the empirical findings we can hypothesize that several findings are also applicable for other cultures, i.e. comparable cultures to the Netherlands, characterized by a relatively high degree of urbanisation, relatively intensive agriculture and a loss of connection between society and agriculture. Firstly, we expect that the conclusion, that livestock production systems have more values than solely food production, can also be found in other cultures. Secondly, in general we can conclude that citizens value both technological aspects (such as automation) and natural or cultural aspects (such as an open landscape) at the same time. The fact that agriculture seems to combine these apparently contradicting aspects within one system was valued very positively. We expect that this specific characteristic of agriculture, thus maintaining a balance between nature and technology, could also be an important value in other cultures. However, we like to remark that values can differ between cultures (Hofstede 2001), which means that the aspects and issues, which were identified in the Netherlands, could differ for other cultures. Doerfler and Peters (2006) confirm that ethical issues in animal production systems can differ between cultures and production conditions. Therefore it would be interesting in a second step to compare the definition of sustainability as a socio-cultural concept across social groups, places and time and understand its context dependency.

5.5 Conclusions

The present paper had the objective to define sustainability as a socio-cultural concept for livestock production systems. And the main research question was: how do Dutch citizens value various aspects of dairy production systems? We can conclude that that livestock production systems have more values for society than solely food production, because only one of the ten identified socio-cultural themes directly concerned food-production (SCT 1), whereas the nine other themes concerned values that go beyond food production, such as landscape, nature and culture. One of the main values of agriculture seems the combination of apparently contradicting aspects such as technology and nature within one system. We presented sustainability as a socio-cultural concept, which included both citizens' concerns (SCI) and valuable aspects (SCA). For a sustainable agriculture it is important that both SCI's and SCA's are taken into account. In conclusion, sustainability as a socio-cultural concept for livestock production systems is defined by a wide range of socio-cultural aspects and issues, reflecting citizens' values and concerns of that system.

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"This picture shows a piece of culture. There are many modern farms, but in my opinion a farm should have such windows and a thatched roof." - NL



"I hear cockcrow and smell hay. It brings back memories of my youth in the countryside and with that of continuity and tradition." - NO

"The environment, the animals, the people and 'the spirit on the farm' give a peaceful feeling. It has to be a good life here for the animals, adults and children." - NO

Chapter six

Visiting a farm: an exploratory study on the social construction of animal farming

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Abstract

Most citizens in modern societies have little personal knowledge or experience of farming. This study aimed at gaining insights into the social construction of animal farming by studying how citizens perceive and evaluate modern farming after visiting a farm in real life. We conducted farm visits with citizen panels in Norway and the Netherlands and asked the panel members to register what they saw, heard, smelled and felt and what they appreciated (or not) on the farm. The aspects which respondents registered could be grouped in four themes: the animals and their products, the rural landscape, farm practices and the farmer. When respondents described their experiences of these aspects in a specific farm they appeared to look at them from three angles of vision: Modernity, tradition and naturality. Most respondents wanted farms to be modern, traditional as well as natural, but they were ready to negotiate and to accept compromises. Many respondents considered the farmer to be responsible for reconciling modernity, tradition and naturality. The paper starts with a theoretical analysis of the social construction of nature, rurality and of human-animal relationships. It concludes by discussing the contribution of the findings to the ongoing theoretical debate in this field.

6.1 Introduction

Modern Western societies are urbanized societies, in which most people have hardly any experience with farming (e.g. Cloke 1997). In such societies, the countryside and farming acquire specific meanings. In the present paper we describe such meanings on the basis of dualistic contrasts. It is never possible to study any problem in all its real-world complexity and we are aware that explaining complex realities on the basis of dualistic contrasts bears the risk of oversimplification. However, we use the dualistic approach to illustrate different angles of vision which people use to ascribe meaning to the countryside and farming. Once we defined the different angles of vision, we discuss that the constructed meanings are rather organic and again complex outcomes in which the different angles of vision are weighted (and balanced) against each other. Hence, we follow a reductionist approach of structuring an analytical concept through dualistic contrasts which we use to interpret our empirical results, but we also reflect on the more holistic reality for our interpretations.

One of the contrasts in relation to farming and the countryside is that, 'life on the land' represents the good life compared to life in the city. Farming is portrayed as a more natural, authentic life, away from the artificiality of life in the cities (Eder 1996). The countryside is romanticized and described as 'arcadia' – a place where people, and especially farmers, live close to animals and in harmony with nature (Van Koppen 2002). In this vision the city is viewed as 'Babylon' - a crowded, noisy and dirty place where life is stressful and dangerous (Short 1991, Frouws 1998). Although agriculture is part of the rural idyll, it is at the same time under increasing criticism for putting the environment, food safety and animal welfare at risk (Frouws 1998). Here reference is made to the 'unnatural' developments occurring on modern farms, their industrial character and the resulting careless and disrespectful treatment of animals and nature (Fraser 2001).

The different images of farming within contemporary social imagination are not 'given' but socially and culturally constructed. To understand how these images are constructed it is important to consider the embeddedness of people's knowledge and experience and the context in which their opinions are formed (Macnaghten and Urry 1998, Carolan 2008a). As we have argued above, most people in modern societies have little personal knowledge or experience of farming and their opinions are often based on second-hand information, often obtained from newspapers and television (Cloke 1997). We were interested in what people notice and experience when they actually visit a farm: what they see, hear, smell and feel. What they experience is of course influenced by what they already 'know', which influences how they interpret these experiences (Macnaghten and Urry 1998). Our aim then is to understand how (non-farming) citizens develop an opinion of modern farming when they experience

farming in real life and practice. More specifically we aim to answer the following questions: 1) What do citizens notice on a farm? 2) Which of these aspects of farming do they appreciate and consider as important to preserve for the future? 3) Why do they consider these aspects as important to sustain? 4) Do citizens of different countries, in this case the Netherlands and Norway, differ in what they notice and appreciate in farms and how do they express their appreciation?

The article is divided into five sections. After the introduction, we discuss the recent debates in social theory about the social construction of nature, animals and rurality. We believe that these debates are relevant for understanding how citizens construct their image of farming. The third section describes the research methodology (farm visits with citizen panels) and the research locations in the Netherlands and Norway. In the fourth section we present the empirical findings. The fifth section provides the conclusions and discussion.

6.2 The social construction of animal farming

Over the last decade, ideas from the cultural turn in social science have also been applied in rural studies (Cloke 1997, Barnett 1998, Philo 2000, Morris and Evans 2004, Cloke 2006). The cultural turn in rural studies coincides with an increasing interest among rural sociologists in the social and cultural meanings of rurality, nature and - more recently - animals in modern society. By now it is generally accepted that these understandings and relations change over time and are context and place-specific. Although the cultural turn in rural studies paid much attention to the social construction of nature and the social construction of rurality Cloke (1997), it has somehow bypassed the agricultural sector (Morris and Evans 2004). Hence, there is a need to study the social and cultural meanings of (animal) farming. The present study contributes to this relatively unexplored field by gaining insight into the social construction of animal farming. The social construction of animal farming relates to three debates: the social construction of nature, rurality and human-animal relationships. Below we discuss these debates and the relevance for the present study.

6.2.1 The social construction of nature

Recent social theory departs from the idea that nature is socially constructed and constituted symbolically rather than objectively given (Greider and Garkovich 1994, Eder 1996, Macnaghten and Urry 1998). The way in which nature is perceived depends on its historic, geographical, and social context and is culturally defined (Eder 1996). There is no one singular nature, only natures (Macnaghten and Urry 1998). In the past nature was often depicted as a wilderness, a dangerous place or intimidating force that needed to be tamed (Short 1991). Modern day society conceptualizes nature in

several ways. On the one hand, nature is considered as 'Arcadia' (Van Koppen 2000) - a realm of purity and moral power, to be enjoyed or worshipped (Eder 1996). At the same time, nature is seen as under threat from modern society's drive to control and dominate nature (Eder 1996) and to use it as a production resource (Van Koppen 2000). With new technological developments domination all too easily turns into exploitation and (potentially) destruction (Macnaghten 2006). Nature therefore needs to be protected and preserved, ultimately to safeguard the future of humanity.

Farming plays an important role in both these conceptualizations of nature. It figures as a threat to nature, because of the negative effects of modern production methods (Eder 1996, Franklin 1999). But farming may also figure as part of nature and its preservation, especially when traditional and 'natural' production methods are employed (Macnaghten 2004). In the latter concept, the traditional farm is an important element of the countryside and natural rural landscape and therefore part of the rural idyll and pastoral myth.

6.2.2 The social construction of rurality

Social understanding of 'the rural' changes over time and place. Compared with urban areas, the countryside may be pictured as remote, backward and unsophisticated but also as honest and authentic, safe and clean. While social perceptions of the rural idyll are persistent, their precise interpretation varies according to time and place (Short 1991, Bunce 2003, Cloke 2003b, Horton 2003, Short 2006). In general, the rural idyll only acquires meaning in contrast to another which is un-idyllic (Short 1991) and "the concept can be used as an ongoing point of reference to less complex ways of simpler and more honest endeavour, and keying into fundamental human desires to sustain some harmony with nature and community" (Short 2006: p146). Farm life is part of this romantic picture representing the good and traditional way of life in which people lived in harmony with each other, with nature and with animals. Farmers are not so much producers in this pastoral myth but act more as proverbial shepherds, watching over and caring for their animals.

After WWII farming became increasingly mechanized and rationalized and anti-idyllic images of animal farming came into being (Bell 2006). Since then "the pastoral myth has been sullied by the use of pesticides, and fertilizers and by the emerge of factory farming systems where cows never feel grass beneath their feet and hens live and die in small cages in sunless rooms lit only by electric light" (Short 1991: p38). With modernization, farming became the offender instead of the defender of idyllic traditions and one could even say that the idyll has 'been turned against' farming (Short 2006: p143). Increasingly citizens have grown concerned about damage to the environment, the destruction of cultural

landscapes, the loss of farming traditions and about food safety and animal welfare. However, the rural idyll appeared remarkable persistent, in the sense that people seem willing to 'forget' or 'close their eyes' for the production-side of farming in favour of the idyll (Franklin 1999) and over the last decades the countryside became disconnected from agricultural production (Frouws 1998).

6.2.3 Human-animal relationships

The relationship between farm animals and humans has been described as the oldest and most intimate of all society-nature relations (Buller and Morris 2003), but it is also an ambivalent relationship (Eder 1996). The ambivalence can be traced back to the two classical and dichotomous conceptualizations of nature described above: as being wild and to be controlled and as vulnerable and to be protected (Eder 1996, Macnaghten and Urry 1998). On the one hand farm animals represent the modernist conception of nature as wild and to be tamed, domesticated, husbanded and controlled (Buller and Morris 2003). Using farm animals for human purposes is part of the desired and taken-for-granted dominance of humans over nature. On the other hand farm animals symbolize nature and 'the rural' which, in the post-modern romantic construction, need to be protected (Eder 1996). They embody rural traditions (e.g. traditional breeds) and colour and animate the landscape with their presence and diversity (Yarwood and Evans 2000, Buller 2004). In this symbolic role animals are seen as 'icons of nature and rurality' (Buller 2004: p139), which should be looked after by caring farmers and should lead a good and happy life. But at the same time, farm animals are kept in 'factory farms' where they are turned into a means of production and become "victims of a greedy, global economy" (Franklin 1999: p3), just like nature. Consequently, farming practices are called into question, raising for example animal welfare issues (Buller and Morris 2003).

Furthermore, emotional and social ties with animals increased in the 20th and 21st century, which gave animals a rather paradoxical position (Tovey 2003, Macnaghten 2004, Wilkie 2005). That means, via increased empathy we feel connected to farm animals, but at the same time we use and eat them as meat. This instrumental value clearly distinguishes them from being human.

To summarize, human- farm animal relations in the 20th and 21st century are complex, ambiguous and even paradoxical (Yarwood and Evans 2000, Buller 2004, Macnaghten 2004, Jones 2006). Social values shifted in the sense that production and economic purposes of animal farming are not taken-for-granted anymore (Buller and Morris 2003). Instead, animal farming also reflects values of nature, culture, rurality and empathy towards farm animals. The present study tried to gain further insight in "the complexities, paradoxes and messiness" (Jones 2006: p197) of human-farm animal relationships by

better understanding how citizens construct their image of animal farming. The present study therefore started literally at the farm gate by taking people to a farm.

6.3 Research method

In order to investigate citizens' opinions about present-day farming we organized farm visits and asked the participants to observe the farm and to register and elucidate their observations. The following section explains the research methodology in more detail.

6.3.1 Research locations

This study was based on the idea that nature, the rural and human-animal relationships are socially constructed and consequently are culturally defined (Greider and Garkovich 1994, Eder 1996, Macnaghten and Urry 1998). As a result we expected the constructions of farming to differ between countries. On the basis of the literature analysis (above), we anticipated that the extent of urbanization, population density, land-use, geography and the relative abundance and the character of natural areas would contribute to these constructions. For this reason we decided to compare the Netherlands and Norway, both developed, modern and high-income countries, but which vary considerably with regard to their geography, population density and land use. The Netherlands is highly urbanized, has a high population density (484 people /km², CBS 2007c) with a large part of the land under cultivation (55.5%, CBS 2007a) and only a few small nature areas, all of which are man-made and managed. Norway is less urbanized, has a low population density (15 people/km², SSB 2008) with large areas of 'wild' and relatively unmanaged nature and only a small part of the land used for agriculture (3.2 %, SSB 2008).

We decided to focus on dairy farming as it is a prominent and traditional sector and occupies a relatively large part of the agricultural land in both countries. It has been practiced for hundreds of years and people in both countries associate farming with dairy farming (Haartsen *et al.* 2003b). Moreover, in both countries, the aesthetics of the countryside have been, and remain, strongly influenced by dairy farming: pastures with grazing cows are considered as a tangible characteristic of the countryside. In the Netherlands, dairy farming has been strongly modernized since World War II, when Dutch farmers were stimulated to produce as much and as efficiently as possible, resulting in highly productive dairy farms. In recent years Norwegian agriculture has also been stimulated to become more cost-efficient (Storstad and Bjørkhaug 2003). To survive financially, two types of dairy farms are developing. The first, 'organic dairy farming', can be seen as a continuation of the traditional, relatively small scale pattern of dairy farming in Norway. The second type is called '*samdriftsfjøsset*' (joint-shed-farm) in which several farmers merge their farms and cattle herds and build one large '*fellesfjøsset*' (cubicle shed). The farmers manage

the joint-shed-farm together so as to produce as efficiently as possible for the conventional market⁴. In order to give the respondents a realistic idea of dairy farming we selected farms that represent the most common practices in each country. In the Netherlands we selected six average dairy farms located in three different areas; in each area one of the farms was involved in nature and landscape conservation. In Norway, we selected one organic and one joint-shed farm in the same area. Due to time and financial restrictions we were unable to include more farms and citizen panels in Norway. In the analysis we did not differentiate between farms, because of these small group sizes.

6.3.2 Data-gathering method: farm visits - a lived experience

In modern society many citizens know little about farming from first hand experience; they hardly know where their food comes from, how it is produced or what farming actually entails (Holloway 2004). There seems to be a 'collective blanking out' of farming and especially of those aspects that involve the use of animals (Macnaghten 2004). As Franklin (1999: p127) states from the 19th century onwards livestock production systems have been "deliberately obscured from the sensitive and critical public gaze". We conducted farm visits with (non-farming) citizens so they could personally experience 'the farm'. Lived experience involves sensing, feeling and knowledge and gives insights into people's perceptions of reality. This matches the notion that social practices are embodied, and experienced through the body rather than purely intellectually grasped (Macnaghten and Urry 1998, Carolan 2008a). This study gave citizens the opportunity to experience a dairy farm in reality by visiting one. In total eight panels (with eight respondents in each) visited eight farms. Each panel visited two farms on the same day, with the sequence of the visits changing for each panel. In the Netherlands the farm visits took place in the spring and autumn of 2005 with six citizen panels visiting dairy farms in three areas (Friesland, Brabant and Zuid-Holland). In Norway the visits took place in autumn 2006 when two citizen panels visited two dairy farms in one area (Vestfold).

The farm visits were organized in the following way. Firstly, the farmer told his or her story about the farm. Each respondent received a hand-out with specific information about the farm (land area, number of animals, litres of milk produced, etc). Then the farmer gave the respondents a guided tour of the farm and farm land. Thereafter, the respondents walked around unaccompanied while responding to a questionnaire.

The questionnaire focused on sensory perceptions, on the grounds that sensory perceptions are the

⁴ The joint-shed-farm in Norway is comparable with the production methods of conventional dairy farming in the Netherlands, except for the social organization of the farm, since in the Netherlands it is rare for one farm to be run by three farmers.

primary basis for reflection (Merleau-Ponty 1970) and provide a way to gain insights into people's experiences (Krogh 1995, Krogh and Clementsen 2004, Carolan 2008a). We asked the respondents to note down what they smelled, heard, saw and felt; we also asked them to indicate if their perceptions were positive, negative or neutral and to try to explain their judgments. In addition, each participant received a digital camera and recorded ten pictures per farm representing valuable aspects of the farm which, in their opinion, should be preserved for the future. A few days after the farm visits, the respondents received their pictures by post. We asked them to select five pictures per farm that represented the most valuable aspects, to explain their choice and to send the pictures and explanations back to us.

6.3.3 Data analysis

The questionnaire was designed in Dutch and translated into Norwegian by a bilingual Norwegian. With perceptions and feelings a correct understanding and interpretation of words is of crucial importance. In order to analyze the Norwegian and Dutch data, one of the Dutch authors learned Norwegian. She translated the Norwegian data into English and discussed her translation and interpretation with the Norwegian author. For the analysis of the data we used the programme Atlas.ti (2006). We created two databases: one Norwegian (with English translation) and one Dutch database. Each consisted of one document per respondent: a total of 16 and 47 primary documents, respectively. The analysis followed four steps, in line with the four research questions. In the first step we identified what the respondents registered when experiencing the farms. In the second step we analyzed which aspects respondents evaluated as positive and important to preserve. We then analyzed respondents' explanations of their choices and, finally, any differences and similarities between the Norwegian and the Dutch respondents. We wanted to better understand how people construct their image of animal farming and therefore asked them to consider how they perceived and experienced the farm through various senses. In the analysis we did not differentiate between perceptions per sense, because we were interested in perception as a whole.

6.3.4 Respondents

In the Netherlands, we selected the respondents from the *capi@home*-database of the Dutch Institute for Public Opinion (NIPO), using the following selection criteria: age, gender, educational level, place of residence (urban or rural) and value-orientation⁵. In Norway we used the same selection criteria, except for value-orientation. We approached people personally by telephone, inviting them to participate.

⁵ We used value-orientations in another part of the research project. For the present study we did not look at value-orientations and therefore do not further elaborate on this selection criteria.

Respondents in both countries received modest financial compensation for participating, to ensure that not only people with interest in agriculture would participate. Table 6.1 gives an overview of the composition of the panels in both countries. Because of the small group sizes (particularly in Norway with two panels), we did not look for differences between social groups but between countries. Moreover, a quantitative follow-up study in the Netherlands focused on differences between people.

Table 6.1 Composition of six citizen panels in the Netherlands and two in Norway

Country Selection criteria	The Netherlands ^a		Norway ^a	
	Intended	Actual	Intended	Actual
Number of panels	6	6	2	2
Total number of citizens (8 per panel)	48	47	16	16
Age range (min. – max. years)	18 - 75	18 - 75 ^b	18 - 75	14 - 82 ^b
Gender (% female)	50	51	50	50
Urbanization (% living in urbanized areas)	50	51 ^c	50	62.5 ^c
Educational level (% higher educated)	17 ^d	36	19.6 ^d	12.6

^a The intended numbers are based on the planned design

The actual numbers show the actual composition of the citizen panels

^b The Netherlands: $\mu = 44.0$, min = 18, max = 75, s.d. = 15.5

Norway: $\mu = 46.0$, min = 14, max = 82, s.d. = 22.6

^c The Netherlands > 1,000 addresses per km², 8 missing values (= one panel)

Norway > 300 inhabitants per km²

^d The Netherlands: Average % higher educated (at least 'Bachelor degree'), Source: Statline 2005 (CBS 2007b)

Norway: Average % higher educated (at least 'short tertiary education'), Source: Statbank 2005 (SSB 2007)

6.4 Empirical findings

The empirical findings give insight into the social construction of animal farming and follow the structure of the research questions. We have illustrated our findings with quotes from the participants. Behind each quotation we note the participants' nationality and number, e.g. NL-14 is respondent nr. 14 in the Netherlands.

6.4.1 Four themes

What the respondents registered on and around the farms could be grouped into four themes: the animals and their products, the rural landscape, farm practices and the farmer. Responses within the '*animals and their products*' theme included references to the variety of animals on the farms: dairy cows, calves and bulls, as well as sheep and chickens. Respondents also noticed the animal products, such as cow milk and meat for human consumption and they often noted details about how the animals were kept and cared for: inside or outside, type of shed, feeding management and the use of cow mattresses and electric rotating cow brushes. The '*Rural landscape*' theme contains all the respondents' observations about the farm yard and house, the garden, the sheds, barns and silos, farm machinery, fields and pastures, fences, shrubs, trees, flowers, farm animals and wild life. The '*Farm practices*'

theme includes all references to the use of technological innovations such as a manure scraper, a concentrate box, a feeding chip and a computer. This theme also included recognition of organizational aspects of farming – for instance that the farm was run as a family farm or that the farmer lived on the farm and combined work and family life. Under the theme '*The farmer*' we grouped all the observations relating to the farmer and his/her personal and professional characteristics, such as enthusiasm, motivation, engagement, close contact with animals, professionalism, and high level of education.

6.4.2 Positive aspects

We structured and analyzed the phrases used by respondents when explaining why they appreciated certain aspects of the farm and of farm-life and considered these important to preserve for the future. In such explanations participants referred to specific elements (e.g. machinery) and the feelings that these aspects evoked (e.g. happiness, nostalgia, fear, surprise or admiration). When the respondents explained what they liked or disliked about what they experienced on the farm, they tended to use terms as "cosy" and "idyllic" but also "efficient" and "unnatural". Their evaluations resulted from reconsidering their experiences from the following three angles of vision: modernity, tradition and naturality. Modernity in farming refers to a continuing process of rationalization, searching for the most productive and efficient farming systems by making use of high levels of technology. Tradition refers to our past and rural way of life. Farming traditions include collective representations and customary ways of doing things, such as the involvement of family members in the farm. And thirdly, farming reflects 'naturality' through farming's intimate interactions with nature, animals and the soil but also its dependence on nature - on the rain, the wind and the sun. On the basis of these three angles of vision, we schematically summarized a selection of responses (one per theme).

Animals and their products

Scheme 6.1 summarizes those aspects about '*animals and their products*' that the respondents evaluated as positive and important to preserve. Respondents in both countries appreciated that the farms produced food (milk) for human consumption and the modern, and consequently hygienic and safe, way in which the food was produced (part of modernity). Norwegian responses included the view that food produced in Norway was important for safeguarding public health. "We all need to have food. Times of crisis might come and then it is good to produce sufficient food ourselves. Nowadays we can buy cheap food from abroad, but we can never be sure about their use of biocides. Let us buy Norwegian food with the guarantee that the products are fresh and free of pesticides." (NO-2). Participants from both countries appreciated the way in which animals were kept in present-day, modern farms and the use of innovative devices such as cow mattresses, electric rotating cow brushes and

automatic feeding technologies which, in their view increased animal welfare as well as production efficiency.

Dutch respondents valued grazing cows and dairy products such as cheese and milk, because they preserved Dutch culture and identity (part of tradition). "For me dairy farming is part of Dutch culture: Dutch cattle in the pasture, black-pied in the north and red-pied in the south, has defined the Dutch landscape through the years. Also Dutch cheese is famous all over the world." (NL-25). In Norway, respondents valued the diversity and variety in both animals and products at the farms and the presence of traditional cow breeds, such as Jarlsberg cows, rather than Norwegian Red Cattle (part of tradition). In addition, they appreciated the variety in food products as a contrast to mono-production.

Dutch respondents considered it important to preserve the "animals' naturalness" and expressed the view that farm animals should be kept in an environment that resembles nature as much as possible. Animals should have enough freedom of movement and the opportunity for expressing their natural behaviour. Dairy cows should therefore graze in the pasture (part of naturality). "In my view cows belong outside. A cow is a social animal and needs to have as much opportunity as possible for expressing her natural behaviour in a natural environment" (NL-39). For the same reason they wanted calves to stay with their dams and not be taken away shortly after birth.

Norwegian respondents also appreciated a 'natural situation' in animal husbandry which ensured 'natural animal keeping'. "I value this photograph as it portrays Jarlsberg cows. [...] They look very well taken-care-of; they are beautiful cows, and not pressured to produce an enormous amount of milk; they produce 5000 l/year which is animal friendly. Traditional breeds naturally belong in this farm; they continue to keep animals in a natural way, as in the past." (NO-11). Norwegian participants referred to 'natural animal keeping' as the traditional way of farming (part of tradition), whereas Dutch respondents underlined the need for the environment to be as natural as possible (part of naturality). In both countries, however, the freedom of animals to move, drink, eat and rest whenever they wanted as well as their ability to graze outdoors all year round, were of utmost importance.

Scheme 6.1 Dutch and Norwegian citizens' appreciation of dairy cows and products

Angles of vision	Modernity	Tradition	Naturality
Country			
The Netherlands	<p><i>Food production:</i> Milk production, Human needs, Production oriented.</p> <p><i>Modern achievements:</i> Hygiene, Good product quality.</p> <p><i>Technological innovations:</i> Cow mattresses, electric rotating cow brushes, automatic feeding.</p>	<p><i>Dutch culture:</i> Cows in the pasture, Variation in animal species (e.g. sheep or chickens), Typical Dutch products (e.g. cheese).</p>	<p><i>Animal nature:</i> Natural environment, Natural feed, Freedom to move, Being able to go outside (cows in the pasture), Eat and drink when they want, Birth, Natural mating, Dam and calf living together.</p>
Norway	<p><i>Food production:</i> Milk production, Production oriented.</p> <p><i>Modern achievements:</i> Hygiene, Food safety, Public health.</p> <p><i>Technological innovations:</i> Cow mattresses, electric rotating cow brushes, igloo huts (outside calf pens).</p>	<p><i>Norwegian culture:</i> Natural way of farming, Variation in cow breeds (e.g. Jarlsberg), Taking care of traditional breeds (should not become extinct), Variation in products (not mono-production).</p>	<p><i>Animal nature:</i> Freedom to move around, Freedom to choose (in- or outside), Cows in the pasture, Eat and drink whenever they want, Fresh air, Natural manure, Natural mating.</p>

The rural landscape

Scheme 6.2 gives an overview of respondents' appreciation of *'the rural landscape'*. Participants from both countries appreciated the idyllic beauty of the rural landscape and its reflection of their country's culture and traditions (part of tradition). The sound of a tractor, the smell of cows and straw and the peaceful rural environment evoked childhood memories and feelings of nostalgia. Wind, fresh air and the sounds of birds (part of naturality) were tangible aspects of such a quiet and peaceful environment and evoked relaxed and happy feelings. Norwegian respondents valued the *'fred og ro'* (peace and quiet), which the Dutch respondents described as *'rust en ruimte'* (quiet and open space). Although they used slightly different terms, they were expressing the same value: a peaceful and quiet countryside as a counterweight to 'the stress of daily life'. Both Dutch and Norwegian participants also valued the openness of the rural landscape, although, for different reasons: Norwegian respondents expressed their fear that the forest may take over the land if farmers stop cultivating it (part of naturality). "This picture [of cows in the pasture] is most valuable to me because [it is] important that the growth of forest and bushes is restricted. At the same time the cows are able to graze in the open landscape." (NO-16). Dutch respondents appreciated the open farming landscape as a buffer to urbanization. "The Netherlands is becoming too full and over-urbanized. The countryside has to stay as it is, as a counterweight to progressing urbanization." (NL-17).

Dutch respondents appreciated the rural landscape as a green area and part of naturality. They described the rural landscape as a 'natural' landscape that should contain a variety of farm animals (part of nature). "This picture of sheep and lambs is valuable to me. This is how I see nature." (NL-13).

In Norway, respondents valued the rural landscape as a 'cultural landscape' contributing to national culture and identity (part of tradition). "Dairy farming has a hundred-year-long tradition in Norwegian cultural life and for me Norway without dairy production is unthinkable." (NO-5). In both countries several participants stressed that they preferred a varied landscape (part of tradition) to a monotonous one (part of modernity). "I really like the variation and I think that most people appreciate this. [I value] the contrast between the pastures and the ditches and a few trees or sometimes a pool. A varied landscape makes you more curious, you are more taken up by it. I really miss that in a monotonous landscape." (NL-46). One Norwegian respondent considered it important that farming contributed to the viability of the countryside (part of modernity). Others explained that they wanted to see and enjoy the rural idyll and therefore associated the rural landscape with values of tradition and nature rather than with production or modernity.

Scheme 6.2 Dutch and Norwegian citizens' appreciation of the rural landscape

Angles of vision	Modernity	Tradition	Naturality
Country			
The Netherlands	<i>Productivity:</i> Monotonous production landscape.	<i>Cultural landscape:</i> 'typically Dutch', Beautiful, Characteristic for the region, Idyllic, Romantic picture, History, Cultural heritage, Preservation value. <i>Nostalgia:</i> Emotional matter, Old-fashioned, Memories, Farm smell, Pleasant, Cosy, Peaceful environment.	<i>Nature:</i> Let nature run its course, Natural balance, 'Helping' nature, Silence, Bird sounds, Peace and quiet, Open landscape, Beautiful to see, Wind, Fresh air. <i>Pleasant Experience:</i> Feeling of freedom, Being outside, Being happy, Relaxing, Healthy, Holiday feelings.
Norway	<i>Productivity:</i> Viability of the countryside.	<i>Cultural landscape:</i> Classical for Norwegian agriculture, Taking care of the landscape, Beautiful, Aesthetic, Attractive, Fresh air, Healthy life at the farm, Pleasant, Attractive, Positive experience, Quiet. <i>Nostalgia:</i> Sound of tractor, Smell of cows, The way it should be (smell and sounds), Cosy, Old-fashioned, Home-made, Melancholy, Memories of childhood.	<i>Wilderness frontier:</i> Prevent expansion of forest and scrubs, Transition area to the forest.

Farm practices

Scheme 6.3 illustrates respondents' appreciation of 'farm practices'. Respondents in both countries valued technological developments (part of modernity) for two reasons. Firstly, technology reduced farm labour and increased efficiency; and this should contribute to increases in farm income and the farmers' free time. In Norway, participants saw more free time as an important advantage of joint-shed-farming. Secondly, technological innovations reduced heavy work burdens. "Farm work has become easier in modern farms. The sheds are more spacious and allow the farmers to work more efficiently. There are computer controlled feeding boxes (with ear chips) and the milking parlour is adjusted to the farmers'

way of working.” (NL-5).

But Dutch and Norwegian respondents also wanted to preserve farming traditions. They were glad that the farmers’ families were still involved in the farm. And, they gave a high value to farmers’ frequent and close contact with their animals. “Of course there is the contact between humans and animals. [...] This contact is really part of being a farmer. It is about life. I think this is the joy of being a farmer, working with living beings. [...] I can imagine that it greatly enhances the value of your work when you work with animals.” (NL-43). A close and personal farmer-animal relationship demonstrated to the visitors that the farmers took good care of the animals, as in the past. In addition, the participants referred to the continued importance of manual labour as a positive feature, even if a farm might be a bit messy as a result. Both the contact with animals and the remaining importance of manual, artisanal work, made farming seem different from other, more industrial economic sectors. Several respondents found it important to preserve such traditional characteristics, which satisfied a sense of nostalgic longing. Dutch respondents appreciated the link with nature, expressing this through their appreciation of wild life (birds) and nature conservation. In Norway, respondents appreciated the fact that farmers kept the forest back and preventing wilderness from encroaching onto the open landscape.

Scheme 6.3 Dutch and Norwegian citizens’ appreciation of farm practices

Angles of vision	Modernity	Tradition	Naturality
Country			
The Netherlands	<i>Modern achievements:</i> Less heavy work, Good control, Machines, Impressive, Necessary, Progress, Clean, Innovation, Renewal, Good for animals, Efficiency, Sufficient income.	<i>Pastoral myth:</i> Cosy, Taking care of animals and humans, Working with living beings, Knowing the animals, Giving attention. <i>Rural idyll:</i> Personal time schedule, Being free to do what you want, Family, Harmony.	<i>Nature:</i> In touch with nature, Love for nature, Taking care of nature, Actively involved in nature, Protecting birds, Conservation of plants and birds.
Norway	<i>Modern achievements:</i> Clean, Tidy, Practical, New, Useful, Modern, Economically based, Effective, Very modern, Good working conditions, Increased efficiency, Lightens work.	<i>Pastoral myth:</i> Humans need animals, People and animals together, Working with living beings, Taking care of animals, Name plates for the cows (personal relation), Farmer knows every cow, Creating everything that lives. <i>Rural idyll:</i> Always something to do, Farmer and wife, Family, Children.	

The farmer

Scheme 6.4 illustrates how the respondents’ described their perception of ‘*the farmer*’. Here the phrases used could not be categorized into the categories (modernity, tradition or naturality) used above. All the expressions referred to the personal characteristics of the farmer, either as a ‘human being’ or as ‘a

businessmen'. Participants in both countries valued the farmers for similar reasons. They admired their strong motivation, passion and enthusiasm for their farm and profession. "The farmer! Without him there would be no farm, no milk and the countryside would not be put to use. I admired the way that the farmer talked about his profession with so much love, that he was creative in innovating and had a positive vision of the future." (NL-36). The participants valued the closeness of the human-animal contact, not only for the sake of the animals, but also as part of the joy of being a farmer. They also admired the farmers' entrepreneurship, their freedom to organize and manage the farm and their up-to-date knowledge and high level of education. The latter was underlined by Dutch respondents. "It is a large farm with few workers. Such an efficient enterprise demands a lot of knowledge and expertise. This deserves respect: there are no 'stupid' farmers anymore." (NL-23).

Scheme 6.4 Dutch and Norwegian citizens' appreciation of the farmer

Country	
The Netherlands	<i>Type of man/woman:</i> Way of life, Love for animals, Honesty, Enthusiasm, Affinity, The farm is at the farmer's heart, Friendly, Being happy, Hospitable, Respect, Admiration. <i>Entrepreneur:</i> Manager, Businessman, Dynamic, Realism, Much knowledge, Proud, Trust, Openness, Being content, Creativity, Diversity, Eager to work, Skilled.
Norway	<i>Type of man/woman:</i> Joy, Happiness, Harmony, Idealism, Enthusiasm, Optimism, Have faith, Willingness to contribute, Down-to-earth, Friendly, Honesty. <i>Entrepreneur:</i> Realistic, Creativity, Flexibility, Vigorous, Capability, Hospitality, Freedom, Clever, Knowledge, Experience, Strategic thinking, Good planning.

6.4.3 Dilemmas and balances

In this step of the analysis we explored how respondents weighted conflicting aspects against each other and what they saw as a satisfying balance. We found that respondents expressed concerns about potential imbalances and dilemmas between modernity, tradition and naturality. The entwinements between the three angles of visions can be usefully illustrated as a threefold knot (see Figure 6.1, by M.C. Escher © 2008). The knot reflects that the three angles of vision are complementary parts of the whole. Each component influences another. Moreover, the threefold knot avoids notions of hierarchy or priority - all three angles of vision are equally important. And finally, a threefold knot shows the complexity of the interrelations better than a 'standard triangle'; the relationships appear less linear and the angles of vision are not represented by a single dot but by a more diffuse and flexible shape, that can represent transitions between, for example modernity and tradition or naturality and modernity. Below we describe the balances and dilemmas for each theme, illustrated with the threefold knot.

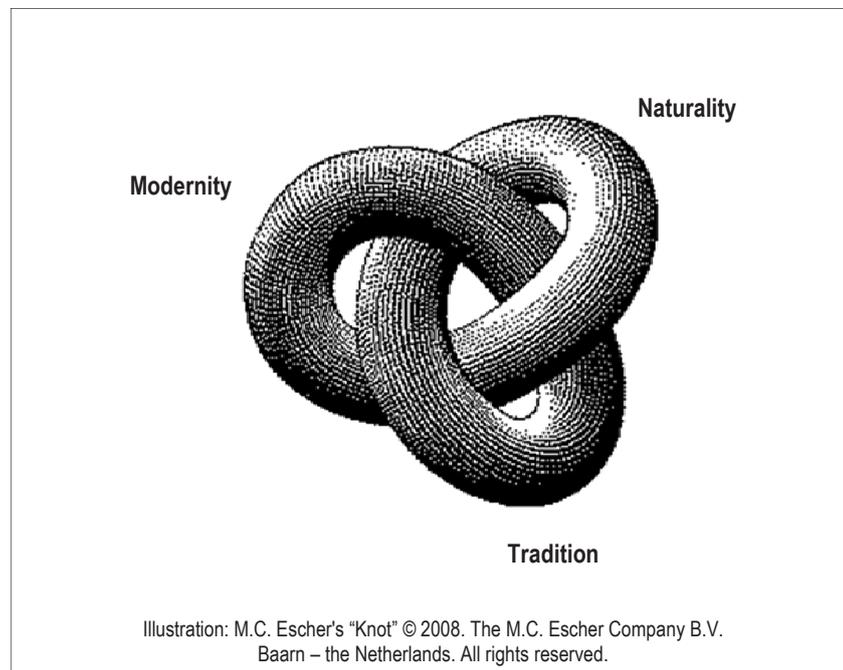


Figure 6.1 A threefold knot represents relations between Modernity, Tradition and Naturality in farming

Animals and their products

Many Dutch respondents expressed concern about modern dairy farming being unnatural and in conflict with nature. They specifically referred to the separation of calf and dam, calves being fed with milk powder rather than their mothers' milk, the use of artificial insemination instead of natural mating, the short life span of farm animals and 'unnaturally' high milk production per cow. "Production comes first. I understand that a farm has to function like a business and that the milk production needs to be as high as possible. But I feel a bit of resentment too. Because what is best for the animals? As humans where are we going?" (NL-43). Several respondents, recognized that such modern aspects are inherent to farming today and that this reality should be faced. "On the other hand I am quite realistic: It is an enterprise after all. When cows are no longer able to produce milk [...] they should go to the slaughterhouse. If you do not want to face that reality, you should not buy milk." (NL-36). Sometimes naturality and modernity complemented each other. Dutch respondents mentioned for example that innovations, such as cow mattresses, increased the naturalness of the environment by imitating it or by compensating for the lack of it. "This picture [of a cow shed] is valuable to me because the cow has sufficient space to move around; she is not tied in a box. The half-open shed copies the natural environment as much as possible." (NL-39).

The Norwegians were less concerned about the conflict between naturality and modern production than the Dutch respondents, although they were also worried about the short life span of production animals. “[I feel] wistful. Short lives. More the feeling of an industry.” (NO-3). Norwegian respondents accepted that cows were kept for production purposes. And while Norwegians valued a ‘natural way of keeping animals’, they did not necessarily see this as being in conflict with using modern equipment such as individual housing for calves in modern ‘igloo huts’ (outside calf pens). “This picture [of a calf in an igloo hut] is valuable to me because it shows that the calves are well taken care of and looked after. The calves can eat hay exactly when it suits them [...]. And when I see this calf in a ‘private’ and large pen alone with a lot of hay, it makes me happy. That is exactly how it should be.” (NO-9). Several Norwegian respondents, however, worried that the increased specialization of modern farms threatened traditions and might endanger the traditional diversity of farm production. “This picture [of a rooster] is valuable to me because it shows the variety on the farm; it is no mono-production but a wide range of products are made - juice, herbs, eggs, milk, etc.” (NO-14).

In conclusion we can say that Dutch respondents were more concerned about the dilemma between production and the animals’ nature and the imbalance between modernity and naturality. Norwegian respondents were more concerned about the dilemma between farm specialization and the preservation of diversity and variety in farm production. Hence, they feared an imbalance between modernity and tradition (see also Table 6.2).

The rural landscape

The Dutch and Norwegian respondents also perceived the issues around *‘the rural landscape’* as raising quite different dilemmas. In the Netherlands, respondents were concerned about increasing urbanization and recognized the need to maintain an open ‘natural’ landscape. For them the rural landscape represented a relaxed and idyllic environment (that embodies tradition as well as nature), which was disrupted by the noises of machinery. “I am a bit disappointed about the noise of all the machines at the farm. There is more noise pollution here than in a city centre.” (NL-36).

Norwegian respondents mentioned the importance of the cultural landscape as place for relaxation, and were concerned about forests recolonising the cultural landscape as farmers stopped cultivating the land. In addition, several respondents expressed concern about modern farming changing the traditionally diverse rural landscape into a ‘monotonous’ production-landscape. Hence, Norwegians experienced two dilemmas in the rural landscape: with naturality and modernity both endangering the maintenance of the traditional rural landscape (see Table 6.2).

Farm practices

Participants in both countries recognized a similar dilemma about *'farm practices'*, recognizing the conflict between technological and economic development (part of modernity) and the conservation of typical farming values (part of tradition). One Dutch respondent described this in the following way: "This is a picture with a wheelbarrow. It is a very traditional image. It is nice that this can still be found on the farm. It is a tool of authentic manual labour. Of course not everything can stay authentic, this is the dilemma. You also have to be able to survive financially otherwise you cannot realize your ideals. I understand that very well, this is a frequently occurring dilemma." (NL-43). Many Norwegian respondents worried that production-oriented agriculture would lead to a loss of traditions. "The 'old farm' is gone. Farms have become large, factory like, efficient." (NO-14).

But respondents also saw the possibility for combining modern production and tradition: "This picture [of a joint farming shed] is inspiring to me because it shows that traditional milk production can also be modern and develop itself." The same respondent mentioned that nostalgia and development can go together: "This picture [of a tractor] is important to me because it shows both nostalgia and agricultural development." (NO-15). Both Dutch and Norwegian respondents were enthusiastic when innovations and new techniques went hand in hand with maintaining the traditional farm. "This picture [of machines and a shovel] shows the activity at the farm: There are colourful machines behind the gauze and an old-fashioned shovel at the front. For me this picture shows how renewal, innovation and new techniques need not damage the value of the farm" (NL-36). In general participants appreciated technological innovations (part of modernity) but at the same time wanted to preserve farming traditions (part of tradition) (Table 6.2).

Table 6.2 Perceived dilemmas in Norway and the Netherlands between three angles of vision (modernity, tradition and naturality) for three themes

Country	Themes		
	Farm Animals and their products	Farming Practices	Rural landscape
Norway	Modernity - Tradition	Modernity - Tradition	Modernity - Tradition Naturality - Tradition
The Netherlands	Modernity - Naturality	Modernity - Tradition	Modernity - Tradition Modernity - Naturality

The farmer

When analyzing the respondents' observations about *'farmers'*, it was apparent that they saw them as being at the centre of all of the perceived dilemmas. They expected farmers to handle these dilemmas, solve the conflicts and maintain the desired balance between modernity, tradition and naturality. "[The farmer] has a very reflective attitude to his work. He is well-informed (has a lot of knowledge) about

animals, breeding, chemistry, market, economy together with idealism and engagement.” (NO-12). Only a few respondents expressed criticisms about farmers. “This is a production-oriented company, and a chilly and unpleasant farm. I still think that he is a good farmer, as he is a good businessman. I think it has to be like this nowadays, it is a necessity.” (NL-40).

6.4.4 National differences

The descriptions and perceptions that Dutch and Norwegian respondents provided differed in some respects and showed exploratory evidence for three main points of difference. First, the Norwegian respondents described the rural landscape as a cultural landscape, distinguishing it from ‘free’ (wild) nature. This is clearly expressed in the following quotation: “[I hear] birds chirping. Close to nature, access to the forest, a gradual conversion from free nature to a cultural landscape.” (NO-5). In Norway the rural landscape was considered as a transition area between free nature and the urban landscape. It helps to protect citizens against the wilderness, but was also appreciated for its peace and quiet and the opportunity it gives to escape from the stress of city-life. By contrast, in the Netherlands, the rural landscape is perceived as a ‘natural’ landscape, the ‘green area’ a term used to describe everything that is ‘not urbanized’. The Dutch public also appreciate the quiet and open space of the rural landscape as a contrast to life in the city (Van der Ziel and Steenbekkers 2006). In short, the Norwegian respondents perceived the rural area as a transition area between nature and urban areas, while the Dutch respondents experienced the rural area as part of the ‘green area’ and nature (Figure 6.2). Respondents in both countries appreciated the rural area as being quiet and peaceful, and different from the city. One Dutch citizen stated: “I feel happy. One day at a farm feels more relaxed than a week of holiday”. Gullestad (1992) argues that peace, quiet and silence are connected with achieving a harmonious, balanced state of mind.

Second, the different perceptions of the rural landscape also influenced the perceptions of farm animals. According to Franklin (1999) animals can be part of three different areas: (a) urban, (b) intermediate and (c) relatively wild and natural areas. Norwegian respondents perceived farm animals as part of the ‘intermediate’ areas, whereas Dutch respondents considered farm animals as part of nature. This difference influenced national concerns about the way in which animals were kept on farms. Norwegian respondents generally accepted that animals were kept under human control for utilitarian purposes. They were concerned about the loss of the traditional diversity of animals and animal products but less about the naturalness of the animals’ lives. This last issue was the main concern of Dutch respondents. They wanted the animals to live in a ‘natural’ environment and to live ‘natural’ lives. In conclusion, we can say that Dutch respondents were more concerned about values of naturality when it comes to rural

landscapes and farm animals and Norwegian respondents were more concerned about values of tradition. These findings are in line with a study by Vihinen (2001: p192) who also noted that “the values of the environment and nature were more obvious for the Dutch than rural or agrarian values”.

Third, Norwegian respondents greatly appreciated the production of (sufficient) food in Norway as they considered domestic products to be safer and of higher quality than products from abroad. This is in line with Norwegian consumer studies, which show that Norwegian consumers put great trust in domestic agriculture, food control and products (Nygard and Storstad 1998). Dutch respondents appreciated the export of dairy products and were proud of the world-wide fame of typical and traditional Dutch products, such as cheese and milk.

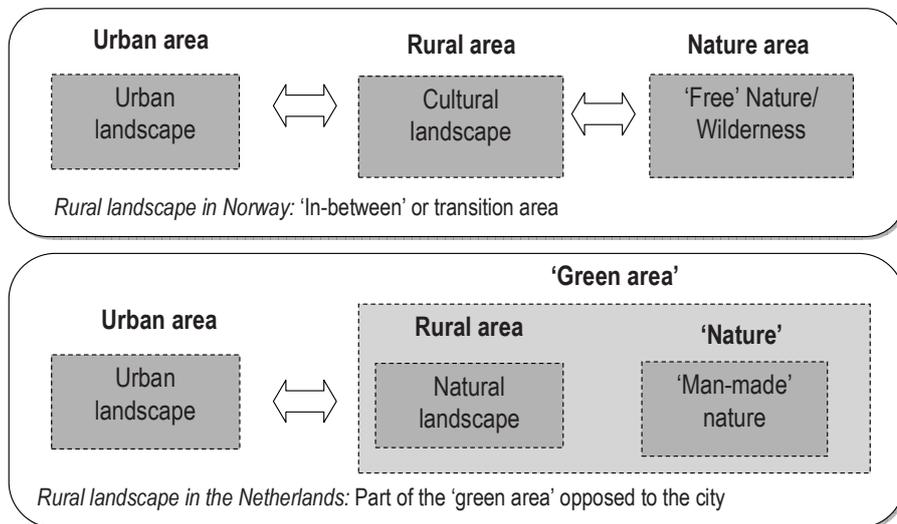


Figure 6.2 Position of the rural landscape in Norway and the Netherlands

Although respondents from both countries were concerned about the loss of farming traditions, the Norwegians showed more concern about this than the Dutch. The following quotation emphasizes the importance attached to farm traditions in Norway and summarizes the main arguments made. “Is the farm important apart from milk production? Is the farmer important? Yes! Would it be sufficient to have just professional large farming milk production? No! Do we need a Norwegian food production? Yes! Can we buy everything in the market? No! Does the farmer’s culture mean something for our identity? Yes!” (NO-14). Most Norwegian respondents wanted dairy farmers to combine aspects of modernity and tradition. These findings are in line the study by Daugstad *et al.* (2006), which depicts agriculture as

both a threat to, and a caretaker of, cultural heritage. "It is thought-provoking that farming is on its way of becoming a cultural institution instead of just being about food production. [...] Why should we maintain agriculture in a world where cheap food overflows the global market?" (NO-12).

Both the Dutch and Norwegian respondents expressed similar thoughts about 'farmers'. In both countries they expected the farmers to solve all of the perceived dilemmas and to maintain the balance between modernity, tradition and naturality. "This picture [of a milking shed] symbolizes the heart of the farm. Ultimately it is all about milk production, this is the place where the animals and the business interest meet every day. This picture shows how the farmer deals with weighing these interests. [...] It made me think that it is possible to combine animal welfare and business interests." (NL-1).

6.5 Conclusions and Discussion

How do these empirical findings relate to the theoretical debates about the social construction of animal farming? Five key points emerge: 1) the content of the social construction of animal farming, 2) the three angles of vision that structure this, 3) the need for balance, 4) the lived experience, and 5) the context-dependency.

6.5.1 The content of the social construction of farming

The empirical findings suggest that social construction of 'the farm' is constituted around four different themes; the animals and their products, the rural landscape, farming practices and the farmer. Several of these themes have been previously identified in sociological debates, such as 'the rural landscape' in the social construction of nature and rurality (Short 1991, Macnaghten and Urry 1998, Cloke 2003a, Short 2006) and 'animals' in the construction of human-animal relations (Buller and Morris 2003; Tovey 2003, Eder 1996). This confirms our expectation that the social construction of nature, rurality and human-animal relations are all relevant to, and interlinked with, the social construction of farming. It is interesting to note the prominent role that the farmer and farm practices play in the construction of farming. This provides a strong link to the human world. The farmer has an important role as a person who has not only professional knowledge but also emotions and affection. In this way the farmer maintains the humane face of agriculture. Their human presence prevents a purely instrumental handling of animals and nature and assures 'care' for animals and nature. This aspect of 'care' is emphasized as important, as expressed in terms of the farmers' love for animals and the link between the farm and the family. Farm practices are also seen as important human ingredients of farming; they link today's farmers with their forebears and farming traditions, but also root them in modernity, where work should not be too demanding physically and should be fairly rewarded. Farmers are not just seen

as economic actors who use their animals as 'means of production'. They are also seen as human beings with a moral responsibility to assure the welfare of their animals. Equally they are seen as fellow-citizens whose wellbeing should be secured as part of modern social justice.

6.5.2 Three angles of vision in the construction of farming

We found that people evaluated their on-farm perceptions by reconsidering them from three angles of vision - modernity, tradition and naturalness. They also explained how they felt frictions between the three. They appreciated the modern, hygienic and thus 'safe' production of milk but also wanted the animals to live naturally. They were in favour of technological innovations, which improved the farmer's working conditions but they also wanted to keep farming traditions alive and to maintain the traditional way of farm life. This is interesting as it demonstrates that citizens' appreciation of farming is not solely dependent upon preserving tradition, i.e. an idyllic image of farming. While it is true that people appreciate tradition in terms of a diversified production, variety of farm animals and traditional landscapes (Yarwood and Evans 2000, Buller 2004), they also greatly value modern achievements, such as safe and sufficient food, sufficient farm income and good working conditions for humans and animals. The respondents seemed happy with modernity as long as nature and tradition were not too threatened.

6.5.3 The need for balance

The respondents realized that their wish for farms to be modern, traditional and natural could only be achieved through accepting compromises. They were ready to do this and weighed the advantages and disadvantages of certain aspects of farming in search of solutions. This confirms Macnaghten's (2004: p548) statement that lay people are willing and able to discuss "very 'real' dilemmas in the 'risk society'". To give one example: participants accepted modern cow mattresses replacing the traditional and natural layer of straw as the mattresses provided additional comfort. But there were limits to the flexibility or elasticity in these evaluations, especially when the naturalness of animal life was concerned. Outdoor grazing is a clear example of this. Norwegian and Dutch respondents were very concerned about the trend of keeping cows indoors all year around. Outdoor grazing was considered as essential and non-negotiable in assuring animal welfare and maintaining an essential element within the typical, traditional rural landscape. It is also interesting that participants thought that farmers should reconcile care for animals, landscapes and production – or in other words to keep modernity, tradition and naturalness in balance. They respected farmers for this ability and showed a lot of trust in them. This however places a large responsibility on farmers.

Hence, respondents took many topics and issues simultaneously into account and looked at animal

farms from multiple angles of vision which were weighted (and balanced) against each other. As such, the constructed meanings of animal farming are more complex and flexible than reflected in dualisms.

6.5.4 The lived experience

The respondents' valuations of the farms were not black and white, in the sense that animal farming was considered as neither 'good' nor 'bad'. Hence, the respondents' valuations of the farms were not dualistic but showed the development of quite pluralistic views. When respondents explained what they appreciated or disliked about the farms, they referred to the rural idyll and the pastoral myth (and hence tradition), but at the same time took into account that 'one needs to be realistic' recognizing elements of the 'anti-pastoral' image - more specifically the hard work by, and low returns to farmers. In this context modernity was not seen as only 'bad', for the respondents appreciated that some aspects of modern farming, such as automatic milking and other machinery, represented improvements. In our opinion this pluralistic view was a result of the direct experience of farming (see also Carolan 2007). Visiting a farm evoked feelings –of nostalgia and appreciation of tradition and continuity, but enabled also participants to recognize and identify with farmers and their right for an adequate income and less physical labour. It also led participants to recognize the comfort and autonomy that modern sheds and devices such as automatic milking and feeding technologies provide to dairy herds (compare with Holloway 2007). The direct experience of the multiple facets of modern dairy production and farm life, led the respondents to develop nuanced views. Instead of judging aspects as 'good' or 'bad' the participants set limits and preconditions for their acceptance and respect. Direct experience, then, seems to promote better understanding of the 'realities' that farmers have to deal with (compare with Carolan 2007). This finding is important for the ongoing political debate about farmers' 'license to produce', but is also interesting for scientific research. Allowing respondents to actually experience the issue in practice, rather than relying on second hand information and cognitive processes expands peoples' frame of reference. We came to know not only what the participants liked or disliked, but also which concepts and ideas the respondents referred to when making evaluations and which information they took in and considered relevant.

6.5.5 Context-dependency

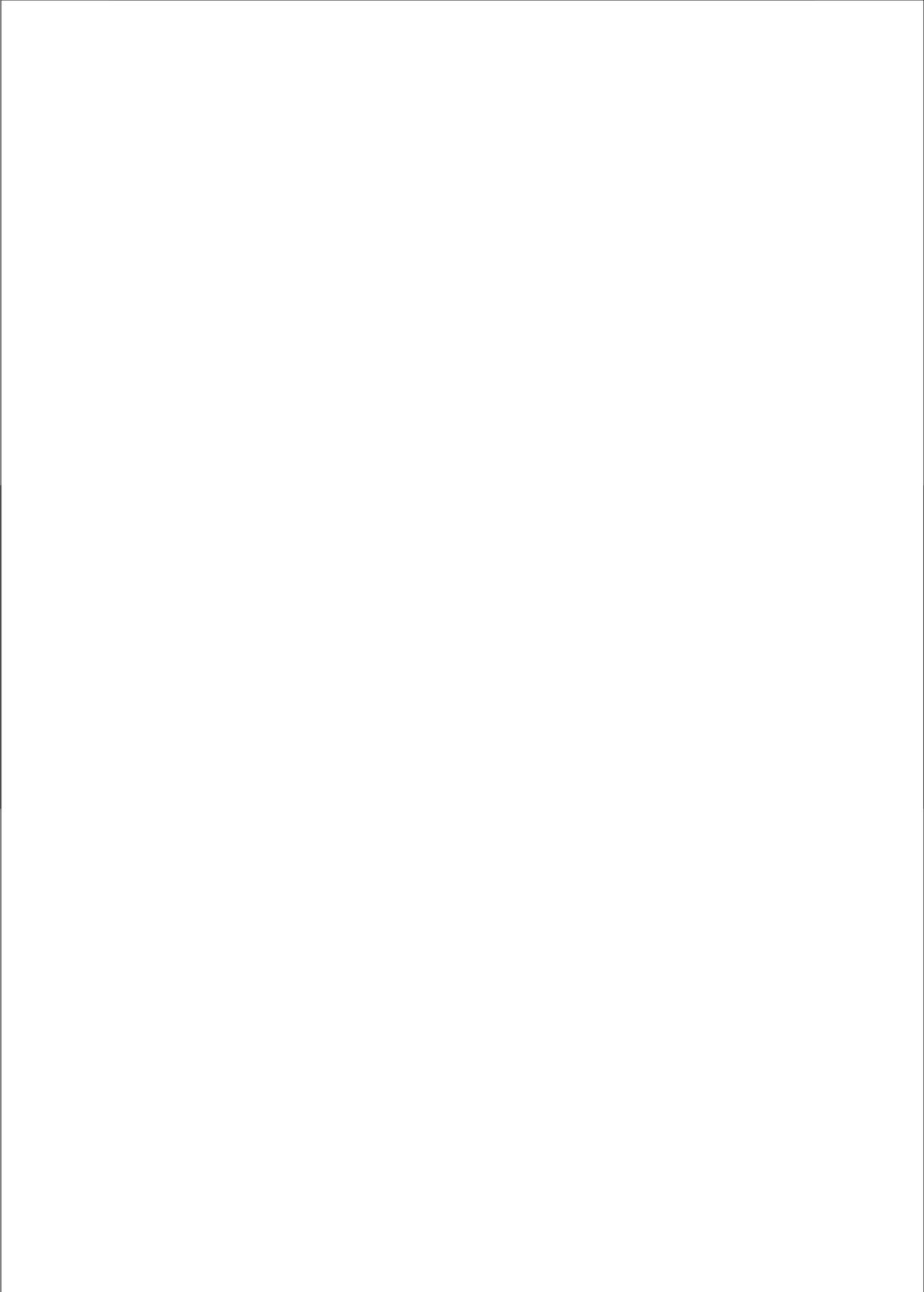
Social constructions are context dependent. The comparison between Norway and the Netherlands showed that there were indeed differences between both countries, but there were also interesting correspondences in the social construction of animal farming. First of all, respondents from both countries referred to similar angles of vision when explaining what they liked and disliked about farming. In both countries they attached importance to maintaining a balance between modernity, tradition and naturality. Neither the Dutch nor the Norwegian respondents judged the farms they visited as purely

good or bad or expressed a preference for a purely modern or purely traditional agriculture. Both nationalities wanted farms to be modern, traditional as well as natural and both were ready to accept compromises and to negotiate the limits of acceptability.

Furthermore, the present study involved visits to dairy farms, a very specific type of farming. Taking citizens to intensive husbandry farms and analyzing their experiences and feelings would most probably revealed more worries and resentment. We anticipate that the threefold knot of modernity, tradition and naturalness would also be useful for analysing citizens' valuations of such farms. This could be a useful further step in understanding the context-dependency of farming sectors and systems. Repeating the research in a more contested farming situation would also increase our insights as to where balances tip over and citizens see the dilemmas as irresolvable.

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"Farm work has become easier in modern farms. The sheds are more spacious and allow the farmers to work more efficiently. There are computer controlled feeding boxes (with ear chips) and the milking parlour is adjusted to the farmers' way of working." - NL



"This picture is important to me because it shows both nostalgia and agricultural development." - NO



"This is a very traditional image. It is nice that this can still be found on the farm. It is a tool of authentic manual labour. Of course not everything can stay authentic, this is the dilemma. You also have to be able to survive financially otherwise you cannot realize your ideals. I understand that very well, this is a frequently occurring dilemma." - NL

Chapter seven

Social acceptance of dairy farming: the ambivalence between the two faces of modernity

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Abstract

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Abstract

Society's relationship with modern animal farming is an ambivalent one: on the one hand there is rising criticism about modern animal farming; on the other hand people appreciate certain aspects of it, such as increased food safety and low food prices. This ambivalence reflects the two faces of modernity: the negative (a threat to nature and traditions) and the positive (progress, opportunity and efficiency). This article draws on a national survey carried out in the Netherlands that aimed at gaining a deeper understanding about the acceptance of modern dairy farming in Dutch society. People take two dimensions into account when evaluating different aspects of modern dairy farming: 1) the way living material is used for production and 2) the way a dairy farm functions as a business. In both these dimensions people appeared to adopt cautious opinions: most people preferred relatively traditional and natural farms and were concerned about the use of nature and treatment of animals in modern production – although this did not imply an outright rejection of modern animal farming. The study also looked for (and sought to explain) differences of opinion between social groups. Besides socio-demographic factors such as age and gender, farming experience and value-orientation appeared the most important variables. The values and convictions within modern society can help explain why some people are greatly concerned about animal welfare while some show less concern. This diversity also helps explain why general information campaigns are quite ineffective in allaying concerns about modern animal farming.

Keywords: Society, Citizens, Public, Values, Animal farming.

7.1 Introduction

In urbanised societies, the spatial and social distance between citizens and farming is growing and many people have little experience with, or knowledge of, farming (Weber *et al.* 1995, Holloway 2004). At the same time, increasing numbers of people support organisations, which stand up for (farm) animal rights (e.g. the 'Party for the Animals' in the Netherlands or Animal Aid in the UK) and which challenge the acceptability of modern animal farming practices. Although many citizens share these views, it is not known how representative these organisations are of general public opinion.

Most studies about public opinions towards modern farming focus on a single issue, e.g. animal welfare (Kendall *et al.* 2006) or the rural area (Van Dam *et al.* 2002). Recent research has shown that people differ in their evaluation of various issues and aspects of modern-day farming (Boogaard *et al.* 2008), besides some issues are "complementary, while others are mutually exclusive" (Hall *et al.* 2004: p213). Therefore a study about the public opinion of modern-day farming should take several issues simultaneously into account. In addition, these views and concerns differ between time and place, which makes it even more difficult to evaluate what the general public considers acceptable or unacceptable in modern (animal) farming and why (Hall *et al.* 2004). Equally, many people lack information or experience about farming and live far from the reality of present-day farming, although this does not mean that they are unwilling to or incapable of discussing the real dilemmas that exist in farming (Jones 1995, Macnaghten 2004). The present study aims at gaining a deeper understanding of the acceptance, or lack thereof, of modern dairy farming in Dutch society. More specifically, it seeks to identify which aspects of dairy farming people consider acceptable and those that they do not. Besides, it tries to reveal and explain differences in opinion.

The paper is divided into six sections. After the introduction we elaborate on modern society's ambivalent relation with animal farming, summarised in what we define as the two faces of modernity. The third section explains the method used for data-collection – a national survey amongst Dutch citizens. In the fourth section we present the empirical findings, followed by the conclusions in section five. In the final section we discuss our findings in relation to current debates.

7.2 Social acceptance and the two faces of modernity

Society's relationship with modern animal farming is ambivalent: on the one hand there is increased criticism about modern animal farming practices, such as the way farm animals are treated and used for production. On the other hand people also appreciate certain aspects of modern animal farming, such as food quality and food safety (Boogaard *et al.* 2008). Any attempt to gauge the acceptability of

modern animal farming needs to bear this ambivalence in mind. Therefore we refer to a classical - but still relevant - debate about modernity.

Modernity is often characterised as a process driven by rational considerations and a firm belief in technological solutions (adapted from Scott 2006). Modernity has been welcomed as a positive development – associated with progress, opportunity, (technological) innovation, efficiency and prosperity. At the same time, however, the pursuit of modernity is also condemned because it frequently leads to a loss of traditions, customs and values (Scott 2006). Modernity thus has both positive and negative faces that exist side by side. Both faces can be found in debates about modern animal farming, as we will discuss below.

7.2.1 The positive face

Modernity in farming refers to a process of specialisation, concentration and intensification (e.g. Tovey 2000). This process started after World War II and was seen as an opportunity to produce more food, more efficiently, and at a lower price. The process was successful; farming systems became very efficient through the application of technology and automation and high levels of human control which rationalised and optimised production (Bos *et al.* 2003). Animal products became much more widely available and affordable. As recently as 2002 there still was “a continuing technological and structural development” in agriculture with a resultant “substantial rise in productivity” (Alrøe and Kristensen 2002: p4). This positive aspect of modernity is the implicit departure point of much scientific literature, particularly in the fields of animal sciences and agricultural engineering. For example, modernity is seen as a way of dealing with environmental problems by making more efficient use of input materials (Annevelink *et al.* 2003) and reducing emissions (e.g. Bos *et al.* 2003); it has the potential to provide social benefits by reducing labour through automatic milking systems (e.g. Oudshoorn *et al.* 2008) or address animal welfare issues by introducing ‘play’ elements into the system (e.g. Bos *et al.* 2003). In summary, the positive face is characterised by a continuous search for optimal, efficient and safe production of food based on a firm belief in technological innovations – reflecting values of progression, efficiency and prosperity.

7.2.2 The negative face

The negative face of modernity is also expressed in criticisms about modern developments in agriculture, which go back a long time. In the 1970s the introduction of milking machines into Dutch dairy farms met with strong resistance among (small) farmers, who were forced to enlarge their farm or – if they were financially incapable of doing so – to quit farming (Bieleman 1998). But modernisation not

only raised economic and social issues; over recent years it has become clear that farming activities can damage the environment and nature (Macnaghten and Urry 1998). Moreover, the emphasis on increasing the productivity of animals is widely associated with negative effects, such as higher levels of disease outbreaks and other animal welfare issues (e.g. Franklin 1999, Macnaghten 2004). These aspects of modern farming threaten to undermine the widely-cherished notion of 'the good life' in the countryside – the rural idyll and pastoral myth (Short 1991, Cloke 2003a). Modern animal farming is associated with industrialisation and "factory farming systems where cows never feel grass beneath their feet" (Short 1991: p38) and where animals are "victims of a greedy, global economy" (Franklin 1999). Hence modern animal farming has many negative aspects, ranging from the loss of nature, depletion of resources, pollution of the environment, negative effects on animal welfare, loss of culture and a decrease in the diversity of landscapes and food products. In summary, it can be described as a threat to natural and traditional values.

7.2.3 Public perception of modern farming

After WWII the positive face of modernity dominated society's relationship with farming. Today by contrast the public seems more familiar with the negative aspects of modern animal farming systems. In response, farmers and agricultural organisations have initiated several attempts to highlight the achievements of modern farming (Holloway 2004). Recent studies (e.g. Boogaard *et al.* 2008) have shown that citizens appreciate certain aspects of modern animal farming, such as hygienic farm practices and technological innovations (e.g. automatic feeding devices). Thus while citizens seem more familiar with the negative face of modernity, they do not fully reject modern animal farming. Citizens are not for or against animal farming as such; they value certain aspects and criticise others simultaneously. Farmers and agricultural organisations often argue that the public is misinformed (Fraser 2001) and that a more accurate image of farming needs to be reconstituted by providing more information to the public (Holloway 2004). But people do not shape their opinion on the basis of knowledge and experiences alone; values and convictions also play an important role (Tuan 1974, Te Velde *et al.* 2002). In addition, we know from earlier studies (e.g. Haartsen *et al.* 2003a, Sharp and Tucker 2005, María 2006) that socio-demographic variables such as gender, age, education and income influence people's opinions about farming. For example, women are generally more concerned about animal welfare than men (e.g. María 2006) and elderly people have different expectations of the countryside than younger generations (e.g. Haartsen *et al.* 2003a).

7.2.4 Frame of reference

To develop our understanding of social acceptance for modern animal farming, we made use of the

'frame of reference' concept and specifically focused on two of its main components: 'knowledge and experiences' and 'values and convictions' (Te Velde *et al.* 2002). We used three variables to express 'knowledge and experiences': whether people grew up or lived in a rural area; if they had visited a farm in the past two years and if they had working experience in the agricultural sector. We also used three variables to capture people's convictions and values: their views about human-nature relationships and human-animal relationships and whether they held religious beliefs. Since values are not directly observable at the individual level; we classified values through the 'WIN'-model ('*Waardenoriëntaties In Nederland*', 'Value-orientations in the Netherlands') from the Dutch Institute for Public Opinion (NIPO). The WIN-model describes eight value-orientations in the Netherlands (Hessing-Couvret and Reuling, 2002). Each value-orientation is derived from ranking different values. The WIN-model is based on well-known value studies (Oppenhuisen 2000, Rokeach 1973, Schwartz and Bilsky 1987) and consists of two axes (Figure 7.1): the vertical axis expresses a continuum between focus on others and self-centeredness and the horizontal axis one between progress and conservatism. The WIN-model distinguishes between the following eight value-orientations (Table 7.1): socially minded, caring and faithful, conservative, hedonist, materialist, professional, broad-minded and balanced (Figure 7.1 and Table 7.1).

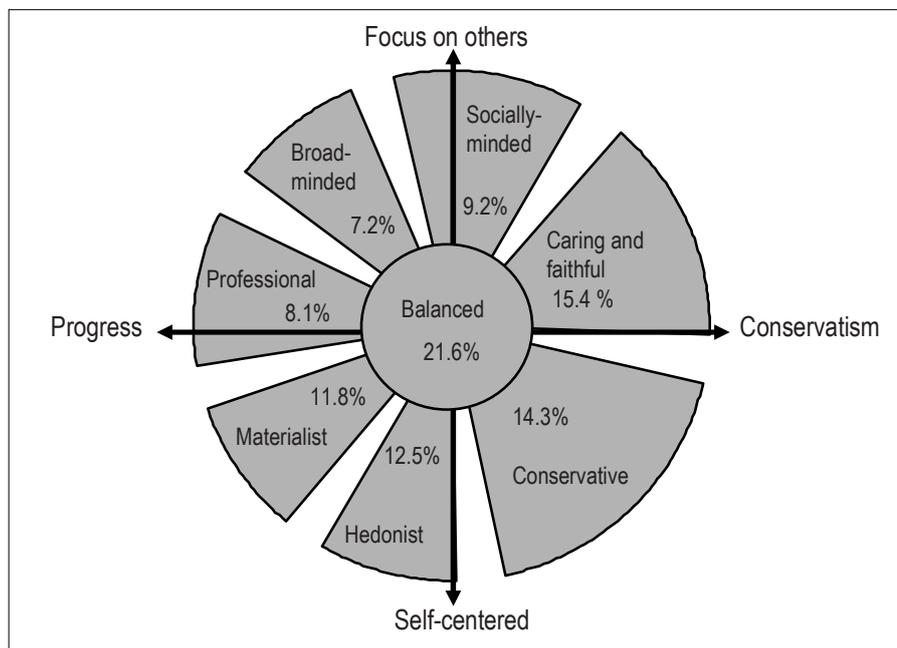


Figure 7.1 Eight value-orientations in the Netherlands and their frequency of occurrence in 2007 (WIN-model) (Hessing-Couvret and Reuling 2002)

Table 7.1 Key values within the eight value-orientations within the Dutch WIN-model
(adapted from Hessing-Couvret and Reuling 2002)

Value-orientation	Most important values (based on Rokeach 1973)
Socially minded	Equality, inner harmony, a world of beauty
Caring faithful	A world of peace, equality, national security, salvation, helpful, forgiving, honest
Conservatives	Family security, clean, loving, obedient, polite
Hedonists	Pleasure, ambitious, cheerful, family security
Materialists	A comfortable life, an exciting life, mature love, ambitious, social recognition, happiness
Professionals	Capable, courageous, a sense of accomplishment, independent, intellectual, logical, an exciting life
Broad-minded	Freedom, imaginative, wisdom, broadminded, inner harmony, intellectual
Balanced	no clear emphasis on any of these values

7.3 Research method

7.3.1 A three-step approach to social acceptance

We approached evaluating people's acceptance of modern dairy farming in three steps (Figure 7.2). We expected that acceptance would be influenced by a combination of their image of contemporary dairy farming and their desired image of dairy farming and so we sought to establish our respondents' images of dairy farming. In the second step we focused on precisely what people considered acceptable or unacceptable in dairy farming in relation to these aspects. In the third step we measured these differences in opinion and tried to explain them by peoples' frame of reference and their socio-demographic characteristics.

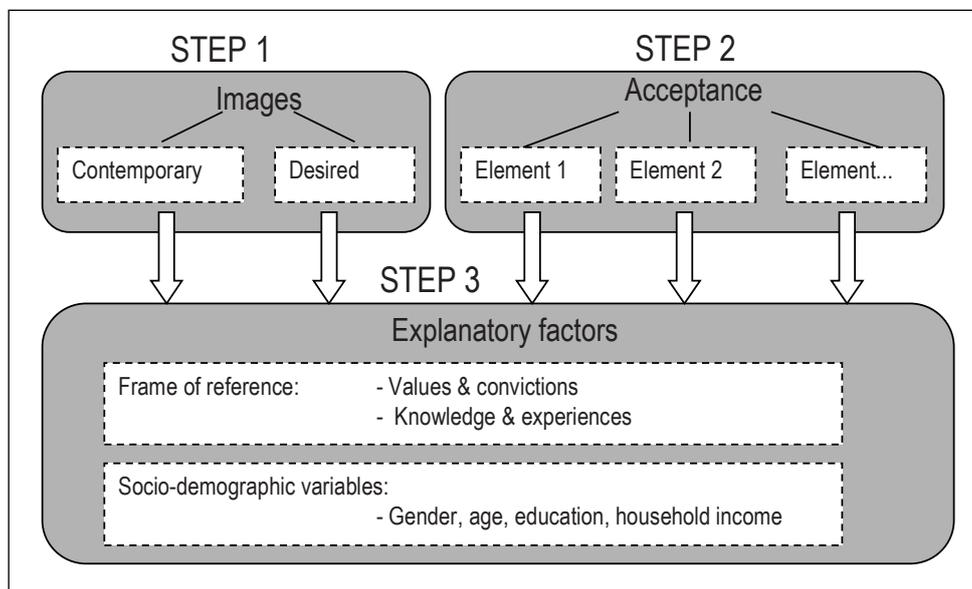


Figure 7.2 Three-step approach to exploring social acceptance of dairy farming

7.3.2 Data-collection: National survey

We conducted a national survey amongst Dutch citizens. The questionnaire was based on an earlier qualitative study, in which citizens highlighted their concerns about dairy farming and the aspects they valued after having visited a pair of dairy farms (see Boogaard *et al.* 2008). The questionnaire consisted of five parts: I) the image of contemporary dairy farming; II-a) the image of the desired dairy farm; II-b) the acceptability of modern developments in dairy farming; III) human-animal and human-nature relations; IV) experience with farming and V) socio-demographic indicators. The five parts of the survey corresponded with the three-step approach (Figure 7.2) in the following way: Parts I and II-a gave insights into contemporary and desired images (step 1). Part II-b related to what the respondents considered acceptable (step 2). For the final step – explaining differences in opinion – we used the answers from parts III, IV and V.

To ensure that the respondents were generally representative of Dutch society at large rather than “non-representative pressure groups with specific agendas” (Hall *et al.* 2004: p224), respondents were selected from the NIPO-database (which includes 200,000 Dutch citizens). Respondents received a financial contribution for their participation to ensure that not only people with an agricultural interest would respond. The survey was programmed and placed online; only fully completed questionnaires were accepted. Within two weeks (between the 27th of February and the 7th of March 2007) 1,178 respondents of the 1,450 people approached had returned the questionnaire. This response rate (79%) is good, even for the relatively experienced respondents within the NIPO-database. We checked the representativeness of the sample for gender, education, age and urbanisation against the standardised data for the Dutch population held by Statistics Netherlands (*‘Gouden standaard’*, ‘the golden standard’, Hilhorst and Verhue 2007). Based on this comparison, the dataset may be considered as fairly representative, except for religious beliefs⁶.

Table 7.2 describes the reference grouping of respondents, which was derived from the 11 variables. Some response categories were not included within the analysis due to low response rates. This is the case for the response category ‘humans are subordinate to animals’ (part of the variable ‘human-animal relations’) and the response category ‘humans are subordinate to nature’, (part of the variable ‘human-

⁶ All the respondents with a religious belief followed some form of Christianity: e.g. Catholic, Protestant or Baptist. Thus other religions such as Islam, Buddhism or Hinduism were not represented. Since Dutch society contains increasing numbers of people following non-Christian religions (i.e. it is becoming a more ‘multi-cultural’ society - see e.g. WRR 2007) this does represent a potential short-coming of the present study. Especially as Muslims, for example, have quite different ideas about, and expectations of, the countryside (e.g. Jókövi 2000), food production and consumption than non-Muslims, i.e. the types of meat that they will eat and the ways in which they are slaughtered (Bonne and Verbeke 2008). This shortcoming is largely due to these groups being poorly represented in the NIPO-database, which consists of 200,000 Dutch citizens, all of whom have a Dutch cultural background.

nature relations'). While asking the respondents which religion they adhered to, we only distinguished between those who defined themselves as 'religious' and 'non-religious'. In a similar way, we measured the level of rurality of respondents' (former) residency on the basis of where people grew up and/or lived now. The combination of these two questions resulted in three possibilities, representing a decreasing level of rurality: 1) grown up, *and* now living, in a rural area, 2) grown up, *or* now living, in a rural area, 3) neither grown up, nor living, in a rural area.

Table 7.2 Respondents' group (n=1178) described by 11 variables

Explanatory factors	Variable	Category	Freq.	%	
Frame of reference	<i>Values and convictions</i>	Value-orientation	Socially minded	117	9.9
			Caring faithful	162	13.8
			Conservatives	202	17.2
			Hedonists	127	10.8
			Materialists	112	9.5
			Professionals	99	8.4
			Broad-minded	73	6.2
			Balanced	251	21.3
		Human-animal relations	Humans are superior to animals	755	64.1
			Humans and animals are equal	416	35.3
			Humans are subordinate to animals	7	0.6
		Human-nature relations	Humans dominate and control nature	192	16.3
			Humans and nature are equal/in harmony	955	81.1
			Humans are subordinate to nature	31	2.6
	Religious belief	Religious	667	56.6	
		Non-religious	497	42.2	
<i>Knowledge and experience</i>	Level of rurality	Grown up and living in a rural area ^a	236	20.0	
		Grown up or living in a rural area	352	29.9	
		Neither grown up nor living in a rural area	586	49.8	
	Farm visit	Visited a farm in the last 2 years	618	52.5	
		Did not visit a farm in the last 2 years	560	47.5	
	Working experience	Working experience in the agricultural sector	133	11.3	
	No working exp. in the agricultural sector	1045	88.7		
Socio-demographic characteristics	Gender	Male	599	50.9	
		Female	579	49.2	
	Age	18-24 years old	143	12.1	
		25-34 years old	197	16.7	
		35-44 years old	238	20.2	
		45-54 years old	215	18.3	
		55-64 years old	194	16.5	
		Older than 65 years	191	16.2	
	Education	Primary education	300	25.5	
		Secondary education	507	43.0	
		Higher education	367	31.2	
	Household income ^b (euro's per year)	Social minimum (< €15.000)	71	6.0	
		Up to modal (€15.000 - €34.000)	374	31.8	
Up to 2x modal (€ 34.000 - €68.000)		413	35.1		
Above 2x modal (>€68.000)		113	9.6		
Don't know / Unwilling to say		202	17.2		

^a A rural living area is defined as "non-urbanised" (< 500 addresses/km², following CBS 2007c).

The area where respondents grew up was classified by themselves.

^b Based on calculations of Statistics Netherlands (CBS 2007c)

7.4 Empirical findings

The statistical analysis of the results consisted of three steps taken in line with the approach described above (see Figure 7.2). In the primary analysis we looked at respondents' contemporary image and desired image of dairy farming, conducting reliability analysis and calculating means and standard deviations. In the secondary analysis we analysed respondents' acceptance of certain developments in dairy farming by conducting factor analysis and reliability analyses and by calculating means and standard deviations. Finally, in the third analysis we explained differences of opinion by means of a general linear model and correlations. We confirmed the analyses by cross validation by comparing a randomised 75%, with the entire sample.

7.4.1 Step 1: two images

Contemporary image

Part I of the questionnaire focused on respondents' contemporary image of modern dairy farming via 17 propositions (Table 7.3). The respondents could indicate their level of support for these propositions on a scale from 1 (disagree completely) to 7 (agree completely). We calculated means, standard deviations and the overall-average of respondents' contemporary image of modern dairy farming (Cronbach alpha was 0.79). A high overall score indicated that respondents were satisfied with contemporary dairy farming and a low score indicate dissatisfaction. The overall average result⁷ (4.82) implied that respondents were more pleased than displeased with contemporary dairy farming. Here we briefly discuss a few noteworthy results (shown in bold in Table 7.3) which highlight the two aspects of modernity. In terms of modernity it is interesting to note that respondents disagreed with the proposition that dairy farmers do not keep up with the times (proposition 17, $\mu = 2.59$) and, in line with this, they generally agreed that "Dutch dairy farming is a frontrunner in technological developments" (proposition 7, $\mu = 5.12$). At the same time, however, respondents confirmed that dairy farming has a one-sided focus on maximising milk production (proposition 5, $\mu = 4.84$) and strongly disagreed with the idea that "the Netherlands can do without dairy farmers" (proposition 15, $\mu = 1.90$). In addition, respondents quite strongly confirmed their views that "Farmers take good care of their animals" (proposition 11, $\mu = 5.47$).

⁷ Several scores were transposed into 'recoded values' so that all propositions were positively directed (on a scale from 1 to 7). The overall average was calculated using these 'recoded values'.

Table 7.3 Contemporary images of dairy farming (17 propositions)

Propositions	Mean ^a	S.d. ^b	n ^c
1. Dairy farming and nature can't co-exist	2.47	1.29	1172
2. Being a farmer is simple	2.39	1.22	1165
3. Dairy farmers pollute the environment	3.26	1.43	1137
4. You need a good education to be a dairy farmer	4.63	1.33	1074
5. Dairy farming has a one-sided, focused on maximum milk production	4.84	1.46	1150
6. Dairy farmers spoil the landscape	2.21	1.23	1168
7. Dutch dairy farming is a front runner in technological developments	5.12	1.08	1006
8. Dutch dairy farming is maintained by subsidies	4.27	1.37	1035
9. The income of dairy farmers is too low compared to their work load	4.95	1.32	1036
10. Dairy cows have too little space to move around in modern sheds	4.56	1.56	1125
11. Dairy farmers take good care of their animals	5.47	1.24	1164
12. Dairy farms smell bad	3.52	1.59	1152
13. The Dutch dairy sector does not mean much on the international market	3.03	1.32	1014
14. Nobody wants to become a dairy farmer anymore	4.09	1.36	1107
15. The Netherlands can do fine without dairy farmers	1.90	1.06	1169
16. Life at a dairy farm is healthy for people	4.85	1.21	1126
17. Dairy farmers do not keep up with the times	2.59	1.17	1136

^a Minimum 1 = completely disagree, Maximum 7 = completely agree. **Bold** scores are discussed in the text.

^b S.d. = Standard deviation

^c n = number of valid cases.

Desired image

Part II-a of the questionnaire focused on respondents' desired image of dairy farming. This part consisted of nine times double propositions, one of which presented 'modernity as opportunity'- the positive face, and the other reflected values of tradition or nature – aspects threatened by modernity (Table 7.4). Respondents had to select which of the two they considered most desired or choose the opinion "I don't know". Based on the distribution in percentages (see the bold scores in Table 7.4), the following most desired characteristics of dairy farms emerged: they are different from other business companies; they should be family farms with less than 100 cows, where the animals' interest comes first and the cows are fed with Dutch feed; the farmer should be a craftsperson who works cleanly and hygienically and who produces milk for the world market while taking care of landscape and nature. This image reflects the continued appreciation for tradition and nature - such as family farming, the animals' interest and the preservation of nature and the landscape, combined with aspects of modernity, such as clean and hygienic working practices and producing for export.

We measured the respondents' appreciation of modernity by using a 'modernity-index'. We equally weighed the nine propositions and calculated the reliability on the basis of tetrachoric correlations. Two propositions (nr. 4 and 5) lowered the reliability of these results and we therefore omitted them from further analysis. The final modernity index was the sum of the seven remaining items (Cronbach alpha was 0.78) and had a scale running from 0 to 7; with higher scores indicating a greater desire for

modernity within dairy farming and an average score of zero implying a desire for a completely natural and traditional dairy farm. Although the average score was not zero, it was still relatively low (2.15) and this suggests that respondents prefer a relatively traditional and natural type of dairy farm.

Table 7.4 Desired images of dairy farming: the positive and negative faces of modernity

Nr	Positive face of modernity (opportunity)		Negative face of modernity (threat to tradition and nature)		DK ^a
		%		%	
1	Similar to other business companies	11.8	Different from other business companies	85.8	2.4
2	Commercial company	23.8	Family farm	69.1	7.1
3	More than 100 cows	20.4	Less than 100 cows	66.5	13.1
4	Financial interests come first	6.2	Animals' interest comes first	86.9	6.9
5	Cows are fed with feed from abroad	1.7	Cows are fed with Dutch feed	84.9	13.4
6	Farmer is a manager	2.6	Farmer is a 'craftsman'	96.5	0.9
7	Clean and hygienic working practices	72.3	'Traditional' working practices	23.1	4.6
8	Producing milk for the world market	67.1	Producing milk for Dutch market	26.9	6.0
9	Mono-production of milk	5.2	Taking care of landscape and nature	92.9	1.9

^a DK = "Don't know"

7.4.2 Step 2: four elements of dairy farming

The secondary analysis was based on part II-b of the questionnaire which focused on the acceptability of modern dairy farming. This part consisted of 16 'if/then' propositions, in which modern developments ("if") were juxtaposed with consequences for values relating to tradition and nature ("then"). For example, "If dairy farms become larger, then it is acceptable that the number of family farms decreases". Respondents could answer on a scale from 1 (disagree completely) to 7 (agree completely) or answer 'don't know' (recoded as a missing value). Thus respondents who gave a score of 7 considered the given precondition completely acceptable, and those who gave a score of 1 considered the given development completely unacceptable. A score of 4 (neutral) lay half way between acceptability (less than 4) and unacceptability (more than 4). In a subsequent stage of the analysis we reduced the 16 'if/then'-propositions to four factors using an explanatory factor analysis (Varimax rotation) and then checked the outcome with reliability analyses. The four factors had an eigenvalue of >1 and explained 55% of the variance. The factor loadings were at least 0.45 and most of the criteria for factor analysis⁸ were met. We gave equal weight to each proposition and recalculated the overall average per factor to measure the level of acceptability (Table 7.5). Each factor addressed a different aspect of modern dairy farming: farm practices, farm animals, farm economics and consumer attitudes. The first two of these factors (farm practices and farm animals) relate to the modern-day treatment of animals and nature; in

⁸ Two propositions (nr. 1 and 3) had low communalities and scored on more than one factor therefore we decided to remove them from further analysis. The Kaiser-Meyer-Olkin Measure was 0.78 (should be ≥ 0.50) and Bartlett's Test of Sphericity was significant (Field 2008). The average communality was 0.55 (should be ≥ 0.60) and Cronbach alpha's were around 0.67 (should be ≥ 0.70) (Field 2008). Thus our findings were slightly below the latter two criteria. Nevertheless, we decided - after discussing with a statistician - to continue the analysis with these four factors, as they were the best we could get from this dataset. Moreover, validation with 75% randomly selected respondents resulted in the same four factors.

other words how **living materials** should be used in dairy production. The second two factors (farm economics and consumer attitudes) relate to how 'businesslike' respondents thought a dairy farm should be (in other words how a dairy farm should function as a **business company**) and the extent to which consumers would be prepared to support things they consider desirable. We describe the composition and meaning of each element in more detail below (based on Table 7.5).

Table 7.5 Four factors (elements) of modern dairy farming

Propositions per factor ^a	Mean ^b	S.d. ^c	n
<i>First factor: Farming practices</i> (Cronbach alpha = 0.67)	3.24	1.04	1170
11. <i>If it is efficient and practical for a dairy farm, then it is acceptable that a dairy farm has 3000 dairy cows and a few milking robots.</i>	3.53	1.82	1140
10. <i>If it is efficient and practical for a dairy farm, then it is acceptable that wooded banks are cut down.</i>	2.87	1.44	1105
12. <i>If it is efficient and practical for a dairy farm, then it is acceptable that a dairy farmer does not have daily contact with the animals.</i>	2.72	1.46	1166
13. <i>If dairy farms become larger, then it is acceptable that the number of family farms decreases.</i>	3.95	1.59	1152
2. <i>If it is necessary to keep a farm profitable, then it is acceptable that a dairy farmer has to put economic interest above the animals' interests.</i>	3.13	1.52	1159
<i>Second factor: Farm animals</i> (Cronbach alpha = 0.67)	3.77	1.13	1174
8. <i>If it is efficient and practical for a dairy farm, then it is acceptable that a calf grows up without a dam.</i>	3.04	1.65	1163
9. <i>If it is efficient and practical for a dairy farm, then it is acceptable that cows are artificially inseminated (instead of being serviced by a bull).</i>	4.87	1.62	1159
5. <i>If the costs of a cow become higher than the profit, then it is acceptable that a farmer brings the cow to the slaughterhouse.</i>	4.64	1.62	1157
6. <i>If it is financially necessary for the continuation of the farm, then it is acceptable that cows are kept inside all year round.</i>	2.57	1.43	1170
<i>Third factor: Farm economics</i> (Cronbach alpha = 0.58)	3.15	1.20	1174
7. <i>If it is too expensive to produce milk in the Netherlands, then it is acceptable that dairy farms disappear (from the Netherlands).</i>	2.87	1.70	1162
4. <i>If farms can only exist with governmental subsidies, then it is acceptable that dairy farmers receive subsidies (recoded value)</i>	4.73 (3.27)	1.60	1162
14. <i>If imported milk is cheaper than Dutch milk, then I will buy imported milk.</i>	3.31	1.62	1157
<i>Fourth factor: Consumer attitude</i> (Cronbach alpha = 0.67)	5.14	1.14	1173
15. <i>If Dutch milk is of better quality than imported milk, then I will pay more for Dutch milk.</i>	5.44	1.22	1170
16. <i>If dairy farmers take care of nature and landscape, then I will pay for it.</i>	4.85	1.39	1165

^a The numbers of the propositions refer to the order of questions in the survey

^b Score 1 = completely disagree, 7 = completely agree. Unacceptable developments (mean < 4) are in **bold**

^c S.d. = Standard deviation, n = number of valid cases

Farm practices

Questions about farm practices addressed an underlying dilemma between efficient and profitable production - the positive face of modernity - and a decline of farming traditions, such as reduced farmer-animal contact and a loss of hedgerows or wooded banks - the negative face of modernity. This factor consisted of five propositions, all of which attracted scores of less than 4, thus all the developments

towards modernisation were considered unacceptable. Nevertheless, there were some differences between the five propositions. A decrease in farmer-animal contact was the least acceptable (proposition 12, $\mu = 2.72$), followed by cutting down hedgerows and wooded banks (proposition 10, $\mu = 2.87$). Putting economic benefits above animals' interests was also – although less - unacceptable (proposition 2, $\mu = 3.13$). Farms with a large number of dairy cows (3000) and a few milking robots were also considered unacceptable (proposition 11, $\mu = 3.53$). A decrease in the number of family farms attracted the least negative response, (proposition 13, $\mu = 3.95$), very close to 4, showing that respondents were ambivalent about the trade-offs between modernity and maintaining family farms. The overall average (3.24) implied that respondents found modernity in farm practices at the cost of farming traditions to be unacceptable and modern production techniques to be more negative than positive.

Farm animals

Questions about farm animals reflected an underlying dilemma between efficient and profitable production – the positive face of modernity – and reducing the naturalness of animals - the negative face of modernity. This factor was made up of four propositions. Artificial insemination and slaughter of unproductive dairy cows were considered acceptable (proposition 9, $\mu = 4.87$ and proposition 5, $\mu = 4.64$), whereas zero-grazing and the separation of calf and dam were considered unacceptable (proposition 6, $\mu = 2.57$ and proposition 8, $\mu = 3.04$). The overall average (3.77) implied that modernity in dairy farming at the cost of animals' naturalness was unacceptable, and modernity was again evaluated as being more negative than positive.

Farm economics

The questions about farm economics explored the underlying dilemma of cheap, possibly imported, and unsubsidised milk – modernity as an opportunity – against the disappearance of Dutch milk and dairy farms – modernity as a threat. The factor was made up of three propositions. Respondents were slightly in favour ($\mu = 4.73$) of government subsidies to maintain dairy farming in the Netherlands. They did not accept the disappearance of dairy farms from the Netherlands (proposition 7, $\mu = 2.87$) or the purchase of cheap imported milk instead of Dutch milk (proposition 14, $\mu = 3.31$). The overall average (3.15) implied that respondents considered modernity in farm economics to be unacceptable if it occurred at the cost of Dutch milk and Dutch dairy farms. However, this factor had a relatively low reliability ($\alpha = 0.58$), so care should be exercised with further analysis and interpretation of these results.

Consumer attitudes

Questions about consumer attitudes explored the underlying dilemma of low product prices against

payment for additional values, such as high product quality or maintenance of the landscape and nature. The factor was made up of two propositions, of which “paying more for Dutch milk of higher quality” attracted the most positive response (proposition 15, $\mu = 5.44$). Respondents were also in support of “paying more to farmers who take care of nature and the landscape” (proposition 16, $\mu = 4.85$). The overall average (5.14) implied quite a stated high level willingness among respondents to pay more for these additional values.

7.4.3 Step 3: explanatory factors

In the third step of the analysis we analysed the differences of opinions among respondents. We designed a General Linear Model (GLM) that included 11 independent variables (see Table 7.2) that might explain the main differences in opinions. We first ran the full model for the contemporary and desired images (Table 7.6) and then ran the full model for the four elements of dairy farming (Table 7.6). In addition, we performed post-hoc tests (either Gabriel's or Games-Howel's, depending on Levene's test) (significant at 0.05 level) for significant main effects and to gain further insights into differences between the groups. Below we describe the significant differences for each independent variable. In our analysis of 'farm economics', we were confronted with some statistical restrictions⁹ which led us to conclude that the main effects described in the GLM (Table 7.6) were statistically not robust enough. Therefore we decided not to discuss this element in more detail. Within the four elements of dairy farming, a score of 4 represented a balance between what was considered acceptable (>4) and unacceptable (<4). Numbers in the following text refer to the corrected mean, e.g. “(2.51)” implies that a group of respondents gave a mean score of 2.51.

Contemporary image

Contemporary images of farming were significantly influenced by their degree of rurality, working experience and whether or not they had visited a farm in the past two years, which are all part of 'knowledge and experiences'. Age and holding religious beliefs were also significant factors (Table 7.6). The respondents who grew up and still live in a rural area were the most satisfied with modern dairy farming (5.04), those who either grew up or now live in a rural area scored slightly lower (4.94), whereas people who neither grew up, nor now lived in a rural area were the least content (4.85). People with working experience in the agricultural sector were more satisfied (5.05) with dairy farming than people with no agricultural working experience (4.83). People who had visited a farm in the last two years were

⁹ The adjusted explained variance was very low (3%, Table 7.6). Moreover, validation with 75% of the respondents resulted in different main effects than with the whole sample. In addition the reliability of this factor was quite low (alpha was 0.58, should be around 0.70).

also more positive (5.02) than those who had not recently visited a farm (4.86). Religious people were slightly more satisfied (5.00) with dairy farming than non-religious people (4.88). Finally, people over 65 years old were significantly more satisfied with contemporary dairy farming (5.12) than those between 18 and 44 years of age (4.80 to 4.85). In general, the more familiarity and contact people had with farming, the more satisfied they were with contemporary dairy farming.

Table 7.6 Significant main effects for six dependent variables (full model with 11 variables)

Independent variables ^a	df	Dependent variables						
		Images ^b		Elements of dairy farming ^c				
		Cont.	Des.	FP	FA	FE	CA	
Frame of reference								
<i>Values and convictions</i>	Value-orientations	7	ns	*	**	**	ns	**
	Human-animal relation	1	ns	**	***	***	*	ns
	Human-nature relation	1	ns	*	***	**	ns	**
	Religious belief	1	**	ns	ns	ns	ns	ns
<i>Knowledge and experience</i>	Level of rurality	2	***	ns	ns	***	ns	ns
	Working experience	1	***	ns	ns	*	ns	ns
	Farm visit	1	***	ns	ns	***	ns	*
Socio-demographic								
	Gender	1	ns	**	ns	ns	ns	ns
	Age	5	***	***	ns	***	ns	*
	Education	2	ns	ns	ns	ns	ns	ns
	Household income	4	ns	*	ns	ns	*	ns
Explained variance								
	R ² (%)		13.3	10.2	10.6	18.3	5.6	7.1
	R ² -adjusted (%)		11.2	8.0	8.4	16.3	3.3	4.8

^a*** P<0.001, **P<0.01, *P<0.05, not significant (ns) =P>0.05

^bImages; Cont. = Contemporary Image, Des. = Desired Image

^cFour elements; FP = Farm Practices, FA = Farm Animals, FE = Farm Economics, CA = Consumer Attitudes

Desired image

The desired image of dairy farming was strongly influenced by value orientation, views about human-animal and human-nature relations, (all part of 'values and convictions'), together with gender, age and household income (Table 7.6). Professionals saw the traditional image of dairy farming as being the least desirable (2.36), compared to hedonists (2.10) and socially-minded respondents (1.75). Based on the WIN-model (Figure 7.1 and Table 7.1) we can conclude that conservatives desired a more traditional and natural farm. Differences in beliefs about human-animal and human-nature relations showed that people who believed that these should be on an equal footing preferred a more traditional farm (2.02 and 2.03 respectively) than people who believed in human dominance (2.30 and 2.29 respectively). Women showed a stronger preference for more traditional dairy farms (2.03) than men (2.29). While all age groups showed a preference for more traditional farms, this preference was less pronounced among older age groups. People above 65 years of age gave an average score of 2.59 to this question, those between 45-54 years gave 2.20, those between 35-44 years gave 1.86 and those between 25-35 years 1.85. Respondents with the lowest incomes (social minimum) expressed the

strongest desire for traditional farms (1.84) and differed significantly from those with the higher incomes (those with twice the modal =2.52, those above the modal =2.24).

Farm practices

Acceptance of farm practices was significantly influenced by respondents value orientation and their views about human-animal and human-nature relations (Table 7.6). Respondents who believed in equality in human-animal or human-nature relations were less prepared to accept modern farm practices (3.10 and 3.11 respectively) than those who believed in human dominance (3.47 and 3.46 respectively). Respondents in the groups of faithful and caring (3.19), conservative (3.26) and the socially-minded (3.01) had significantly lower levels of acceptance of modern dairy farming than professionals (3.50) and materialists (3.48). These differences imply that people who value conservatism and who are focused on others consider modernity in farm practices less acceptable than those who value progress and/or who are self-centred (professionals and materialists).

Farm animals

Attitudes towards the treatment of farm animals were guided by a similar set of value orientations as attitudes towards farm practices. Other influential variables included respondents' level of rurality, their agricultural working experience and whether they had recently visited a farm (all related to knowledge and experiences). Age was another influential factor (Table 7.6). Professionals perceived modern developments to be acceptable, even if they occurred at the expense of animals' naturalness (4.21), whereas conservatives, hedonists and socially minded people considered the same developments to be unacceptable (giving scores of 3.85, 3.89 and 3.76 respectively). Although the differences between these categories are relatively small, they are situated precisely across the balance point of what is and what is not considered acceptable (score 4). Thus, following the WIN-model we can conclude that people who cherish values of progress (professionals) consider modernity at the cost of animals' naturalness to be acceptable, whereas those who believe in values of conservatism take the opposite point of view.

Respondents who believed that human-animal or human-nature relations should be based upon equality considered modernity to result in unacceptable treatment of animals (3.67 and 3.83 respectively), whereas respondents who believed in human dominance in these relations considered the effects of modernity on animals' naturalness to be acceptable (4.21 and 4.05 respectively).

Respondents without experience of living in a rural area considered modernity in 'farm animals' to be less acceptable (3.76) than those who currently lived in a rural area or had done so in the past (4.00

and 4.06 respectively). People lacking agricultural working experience considered modernity less acceptable than people with such experiences (3.81 versus 4.07) – again a difference that bridged the divide between acceptability and unacceptability. People who had not visited a farm over the last two years considered modernity less acceptable (3.82) than people who had done so (4.06). Thus, the more experience people had with farming, the more they considered it acceptable to trade off modernity against animals' naturalness.

Socio-demographic variables, and particularly age, were a significant influence on responses to these questions. People older than 65 differed from the other age-categories in finding modernity in animal farming acceptable (4.37), and those between 25 and 34 years old considered the same developments the most unacceptable (3.68).

Consumer attitudes

The level of acceptance in consumer attitudes was significantly influenced by value-orientation, views about human-nature relations, farm visits and age (Table 7.6). Socially minded people were more willing than others to pay for additional services, such as milk quality or landscape (5.45). The largest difference was between socially-minded respondents and hedonists, implying that people who are focused on others express a greater willingness to pay than self-centred people. People who believed in equal relations between humanity and nature were also more willing to pay for added values (5.24) than people who believed in human dominance (4.96). People's knowledge and experiences also played a role, with people who had visited a farm in the past two years being more willing to pay extra (5.18) than those who had not visited a farm (5.02). People over 65 years of age were the most willing to pay extra (5.29) and people between 18 and 24 were the least willing to pay extra (4.98).

Social acceptance in relation to farm images

Finally, we wanted to gain further insights into the relationship between respondents' acceptance of the issues surrounding dairy farming and the images that they had of dairy farms. Therefore, we calculated correlations between the two images and three elements of dairy farming, using Pearson's correlation co-efficients (Table 7.7). Views about farm practices correlated positively with those about the desired image of farming (0.421, Table 7.7); indicating that people who desired more traditional dairy farms were less accepting of modern farm practises. Views about farm animals correlated significantly with both contemporary and desired images of farming (values of 0.279 and 0.374, respectively). The more content people were with contemporary farming, the more they accepted that modern treatment of farm animals would be at the cost of animals' naturalness. Finally, consumer attitudes correlated significantly with the contemporary image of farming (0.103, Table 7.7), showing that the more satisfied people were

with contemporary farming, the more willing they said they were to pay for added values such as maintaining nature and landscapes.

Table 7.7 Correlations between societal images and the level of acceptance of three elements

Images	Elements of dairy farming		
	Farm Practices	Farm Animals	Consumer Attitudes
Contemporary	0.030	0.279**	0.103**
Desired	0.421**	0.374**	- 0.019

** P < 0.01 (Pearson 2-tailed)

7.5 Empirical conclusions

On average, respondents expressed a contentment with contemporary dairy farming (4.82 on 1-7 scale) although, when they could choose between different farm descriptions, they expressed a preference for a rather more traditional and natural type of farm (2.15 on the 0-7 'modernity-index'). Exploratory factor analysis revealed that people take two dimensions into account when evaluating different aspects of modern dairy farming: 1) the way living materials are used for production (as reflected in farm practices and the treatment of farm animals) and 2) the way a dairy farm functions as a business (as reflected in their evaluation of farm economics and their attitudes as consumers). The respondents showed the most concern over the negative effects of modernisation on farm economics (3.15), farm practices (3.24) and the treatment of farm animals (3.77). As consumers they expressed a willingness to pay for added values.¹⁰

On average, there were relatively few differences¹¹ in opinions about modern dairy farming and acceptance of it among respondents. However, respondents' knowledge and experiences, their values and convictions and four socio-demographic variables, did make a difference. Respondents with experience or knowledge of farming (through farm visits, working experience or residency in a rural area) were more satisfied with contemporary dairy farming and more accepting of modern ways of treating farm animals. People who had visited a farm in the past two years were also more willing to pay for added values than those who had not visited a farm.

¹⁰ Several studies have also shown that people are quite willing to pay for additional values (e.g. Bennet 1997). However, it is difficult to translate these findings to actual consumer behaviour, because consumer behaviour is influenced by many other factors than merely 'willingness', and these questions reached beyond the aim of the present study.

¹¹ These small differences might be the effect of the recalculated factor scores, because we calculated the average of the propositions and consequently the average factor score had a lower standard deviation than each proposition (see also Table 7.5). Therefore, the differences within the factor were smaller than the differences of the original propositions would have been.

Socially-minded respondents expressed stronger preferences for more traditional and natural dairy farms and were less accepting of modernity in farm practices and the treatment of farm animals than professionals. More generally the findings showed that conservative people expressed stronger preferences for traditional and natural dairy farms and were less accepting of modernity in farm practices and the treatment of farm animals than progressive people. People who believe in egalitarian relationships between humans and animals and in harmonious relationships between humans and nature also preferred more traditional and natural dairy farms and were less accepting of modernity in farm practices and the treatment of livestock. People who believed in harmonious relationships between humans and nature were also more willing to pay for additional values.

Of the socio-demographic variables, age was the most influential: respondents older than 65 were more satisfied with contemporary dairy farming, expressed less desire for traditional and natural dairy farms, were more accepting of modern methods of treating farm animals and were more willing to pay for added values than younger respondents.

7.6 Discussion

This research aimed to gain insights into Dutch social opinions about the acceptability of different aspects of modern dairy farming. It also sought to make an inventory of and explain differences of opinion within the population. The study simultaneously investigated different aspects of dairy farming (Hall *et al.* 2004) revealing the complexities of people's opinions, which can be ambiguous and contradictory. Two dimensions of modern dairy farming were scrutinised: 1) the way living materials are used for production (where the elements included farm practices and the treatment of farm animals) and 2) the way a dairy farm functions as a business (where the elements included: farm economics and consumer attitudes). The first dimension reflects the dilemma between an instrumental and efficient use of land and animals as 'production resources' and protecting animals, nature and the environment. The second dimension reflects the dilemma between profitable self-supporting enterprises and farms that are supported by governmental subsidies and consumers' stated willingness to pay price premiums. In the following section we discuss the findings in relation to the ambivalence between the two faces of modernity, how social values influence views about the acceptability of modern day dairy farming and the implications of this in terms of 'informing' the public.

7.6.1 The ambivalence between the two faces of modernity

The study was conducted in the Netherlands – a highly urbanised country, with a highly productive and efficient agriculture and relatively little nature. Despite (or because of) this, the vast majority of

respondents (81.1%) considered it important that humans live in harmony with nature. Furthermore, more than a third (35.3%) were convinced that humans and animals should be treated as equals, which may explain the recent success of the 'Party for the Animals'. Against this background one would expect quite low levels of acceptance of modern animal farming practices. This expectation was partly confirmed: on average people found modern animal farming practices to be unacceptable and wanted to preserve and protect nature and animals. But condemnation of modern-day farming practices was moderate and was perhaps tempered by people's appreciation of certain modern achievements, as the following quotation from the study illustrates¹²:

"I consider it important to defend the interests of animals, but this should not be done at the expense of everything else; although intuitively, I would like that to be possible. I understand that a farmer takes his cow to the slaughterhouse when she doesn't produce anymore. If it were down to me, the cow would have a relaxed old age. But I understand that this is not realistic in the Netherlands."

Overall, when comparing the negative and positive evaluations of the various aspects of modern dairy farming, the level of acceptance appears to be balanced and moderate. This does not mean, however, that people are not concerned about modernity in animal farming. The positive and negative evaluations of the different aspects of dairy farming do not completely balance each other out. The two faces of modernity often exist side by side and there is a certain ambivalence between the two.

This ambivalence is perhaps better understood by reverting to the idea of binary opposites. Humans have a tendency to categorise phenomena in opposite pairs (e.g. black and white, positive and negative) and try to mediate between them by searching for a third expression (Tuan 1974). In traffic signals, the colour orange signifies neither 'stop' nor 'go', but 'caution'. Projected onto the topic of this study this example illustrates that people neither entirely accept modernity ('go'), nor do they entirely reject it ('stop'); instead their moderate level of acceptance can be interpreted as 'caution' towards modernity. The term 'caution' captures the idea that people have a concerned or uneasy attitude, which may easily be aroused and mobilised at times of acute problems. Dairy farming has, to date, been a rather uncontested sector (Kjærnes and Lavik 2007). It is quite likely that this yellow sign could well turn to red if citizens were asked to evaluate more controversial animal farming systems, such as pig or poultry production systems. Earlier studies show that these systems meet rather stronger social opposition (e.g. Kanis *et al.* 2003, Sharp and Tucker 2005).

¹² Respondents had the opportunity to make additional remarks at the end of the questionnaire and this quotation is one of these remarks.

7.6.2 The importance of values

The study also shows that people's acceptance of modern-day dairy farming is related to what they find important in life – their fundamental value orientation. The growing divergence in values and convictions within modern-day society helps explain why some people are so concerned about animals' welfare and willing to support the campaigns of animal protection organisations, while others show little response.

The WIN-model distinguishes between eight value orientations expressed as continuums along two dimensions: between a focus on others and being self-centred and between progress and conservatism (see Figure 7.1). From this the model derives eight value-orientations, defined as: socially-minded, caring and faithful, conservative, hedonist, materialist, professional, broad-minded and, balanced. These distinctions proved to influence people's acceptance of modern dairy farming. Conservative people preferred a more traditional and natural farm and considered modernity less acceptable in the use of living materials (farm practices and farm animal treatment) than progressive people. Concern about the negative effects of modernisation in animal farming is, therefore, related to a more generally conservative attitude. At a more detailed level we found the same difference between socially-minded people and those classified as professionals.

The Dutch Institute for Public Opinion (NIPO) describes socially-minded people as follows:

“Socially-minded people are focused on harmony and stability (...). They are social and committed. They think about the consequences for their environment when making a decision. This segment mainly consists of relatively elderly people with quite a high educational level. They have interests in art, nature and politics. They don't have a materialistic mind, but are interested in fine, tasteful things. Their purchasing behaviour is not at all influenced by new gadgets or technology”(summarised and translated from Helsing-Couvret *et al.* 2003).

This description implies that socially-minded people are more concerned about nature and the environment (the negative face of modernity) than about the advantages of new technologies (the positive face). From this perspective, it is not surprising that these people consider modernity in animal farming least acceptable. This description also explains why socially-minded people express the most readiness to pay for additional values and green services. Although it cannot be assumed that they will act accordingly, in practice this is consistent with their generally mindful and responsible attitude. According to NIPO social mindedness is often to be found among elderly people. In our study, however, elderly people (those over 65 years old) were *more* accepting of modernity in farm animal treatment and desired a less traditional and natural dairy farm than younger generations. This can probably be tracked back to idealised views of modernisation that were widely held and promoted in the era when this

generation grew up, and which for many may still be their natural point of reference. By contrast, younger generations grew up in an era where the negative effects of modernisation became apparent and were widely debated, and modernity was no longer unanimously or unambiguously accepted as a force for good.

In contrast to socially-minded people, professionals have a preference for more modern and less traditional and natural dairy farms, and were the group that were most accepting of modern approaches in the use of living materials (farm practices and farm animals). They can be described as:

“Ambitious and independent people, who are focused on their personal development and try to achieve an exciting and stimulating life. They are critical of, but open to, new ideas and different opinions. They are well informed about societal issues and politics. Professional households are most often two person households in the highest income bracket and their pattern of expenses clearly reflects this; they like luxury, tasteful, trendy products and are very accepting of and interested in technical gadgets. Other segments may define this group as ‘Young Urban Professionals’”(summarised and translated from Hessing-Couvret *et al.* 2003).

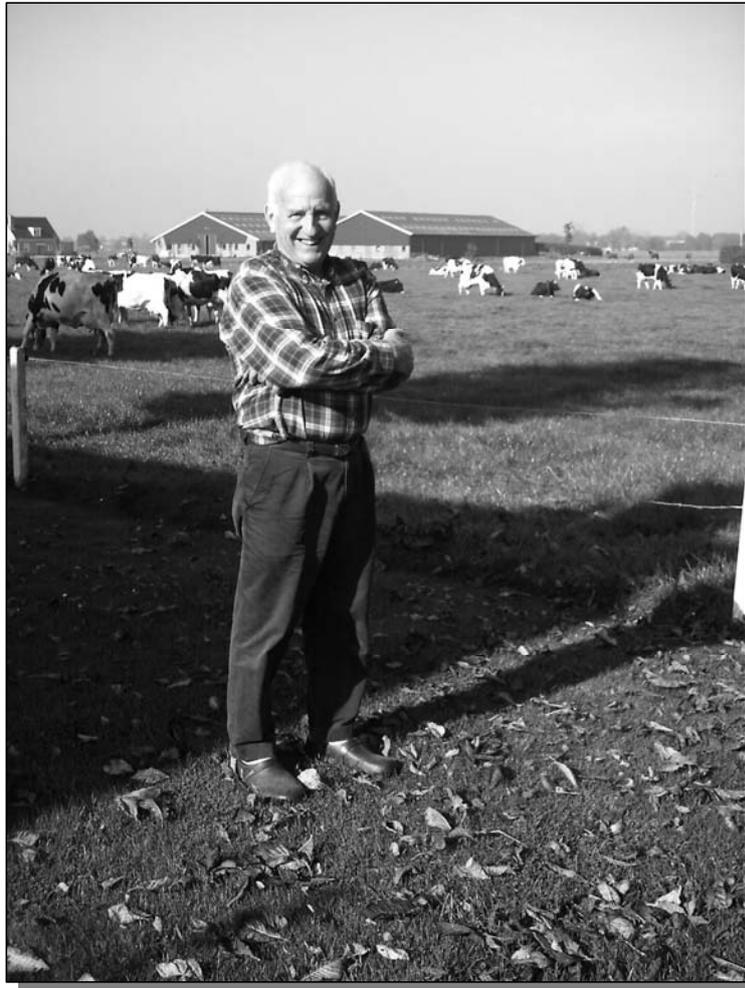
Thus, professionals are mainly young urban people who have faith in technological innovations and solutions, which probably explains their greater level of acceptance of modernity in the use of living materials.

7.6.3 Implications for ‘informing’ the public

People with experience and knowledge of farming were the most content with contemporary dairy farming. In this sense knowledge and experience did positively affect people’s image of modern farming. But this acceptance was also influenced by their value-orientation, especially when considering the treatment of farm animals. Thus, contrary to the expectations of agricultural organisations, generalised information campaigns will only have a very limited effect in influencing social opinions about, and acceptance of, modern farming systems. Concerns about modern animal farming will only be allayed when information is targeted at specific groups and addresses the more fundamental values that shape their concerns. The importance of values also indicates that people not only differ in their recognition of problems, but also in how they will react to proposed solutions. The people who are most concerned about the negative impacts of modern dairy farming are unlikely to be convinced by solutions that rely upon technological innovations. On the contrary such approaches will most probably reinforce their concerns and mobilise their resistance.

Acknowledgements

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"The farmer! Without him there would be no farm, no milk and the countryside would not be put to use. I admired the way that the farmer talked about his profession with so much love, that he was creative in innovating and had a positive vision of the future." - NL

"The farmer has a very reflective attitude to his work. He is well-informed (has a lot of knowledge) about animals, breeding, chemistry, market, economy together with idealism and engagement." - NO

Chapter eight

Conclusions & Discussion

8.1 Introduction

8.2 The socio-cultural issues surrounding animal farming

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8.1 Introduction

The aim of this thesis has been to understand what citizens of contemporary Western societies appreciate about animal farming and which aspects they think are important to sustain in the future. It studies present-day animal farming systems by examining people's opinions and concerns and analysing the meanings that they attach to dairy farming. The thesis describes what can be defined as the 'socio-cultural sustainability' of animal farming systems. It starts by identifying 'socio-cultural issues', i.e. aspects of animal farming about which people are concerned. Secondly, the thesis provides insights into the significance of these issues and the collective meanings underlying them, in other words it provides insights into the 'social construction' of animal farming. Finally, it relates the factors that influence people's perceptions about animal farming to their frames of reference. Through these avenues this study addresses the three research questions set out in the introduction:

- 1) What aspects of present-day animal farming systems are citizens concerned about?
- 2) What collective meanings are attached to animal farming?
- 3) What factors influence people's perceptions of animal farming?

The following three sections of this chapter will answer these research questions, and review the strengths and shortcomings of the research methods that were used. Sections 8.5 and 8.6 will reflect on the implications of these findings for efforts aimed at improving the social acceptance of livestock farming systems and for future research on sustainable development. The final section will summarize the main conclusions.

8.2 The socio-cultural issues surrounding animal farming

In order to understand people's perceptions about animal farming citizen panels were taken to visit dairy farms and, while at the farms, were asked to record their sensory experiences and to note what they considered valuable to preserve for the future, and why. The issues that they raised were defined as the 'socio-cultural issues' of dairy farming and covered a number of different themes, namely: the way food is produced, the income level of the farmer, the handling and living environment of the animals, the preservation of the landscape, nature and the environment, the preservation of farming culture and national identity and services for society (e.g. education or green care). This wide variety of themes confirms that people's concerns about animal farming extend beyond merely that of animal welfare (McGlone 2001) and that dairy farming has more values for society than food production.

Views about sustainability are context-dependent and culturally defined. To better understand the

influence of context, this thesis compared how these issues were perceived and constructed, in two countries; the Netherlands and Norway.

8.3 Collective meanings about animal farming

The farm visits were used to find out which aspects of dairy farming respondents thought should be preserved for the future. The data collected not only provided insights into the aspects that people found valuable (and their concerns), but also illustrate people's explanations about why they find such issues important. From this it was possible to construct collective meanings about animal farming, which were represented as general ideas about the characteristic features of animal farming and value judgements about what people see as the positive and negative aspects of animal farming. This set of collective meanings about animal farming can be described as the social construction of animal farming. It consists of peoples' images of, and expectations about, animal farming, which are based on general ideas about what animal farming looks like, what it should look like and why.

These individual responses can be used to deduce more general ideas about animal farming, since individual consciousness is socially determined (Berger and Luckmann 1967). Hence, the responses of Dutch and Norwegian respondents about what they liked and disliked on dairy farms, and their explanations of why, were analysed to draw out the collective meanings surrounding animal farming. The first stage of the analysis involved looking at what citizens saw and noticed when they were on the farms, and the second stage examined how they valued what they see and how they explained these evaluations. These two steps correspond with two different layers of the social construction of animal farming. The first (or upper) layer indicates what respondents saw and noticed when they were on the dairy farms; which partly reflects what they expected to see and, hence, consider to be typical characteristics of a dairy farm. The things that people noticed on the farm visits can be divided into four general themes: *farm animals and their products, the rural landscape, farming practices and the farmer*. The second (and deeper) layer gives insights into norms and values, showing how respondents evaluated what they saw and the collective evaluative or normative schemes for animal farming that they referred to. The explanations that respondents gave for evaluating different aspects of the farms, fell into three broad categories or three angles of vision: *modernity, tradition and naturality*. People experienced dilemmas between the three angles of vision and their wishes about farming were sometimes contradictory as they simultaneously wanted farms to be modern, traditional and natural and tried to reconcile these three angles. This gave rise to some tensions in the way people view dairy farming, their attitudes towards it and the way that they evaluated it.

These three angles of vision, and the accompanying dilemmas, form the second layer of the social construction and can be illustrated with a 'threefold knot' (Figure 8.1). Respondents experienced different dilemmas and tensions in relation to different issues.

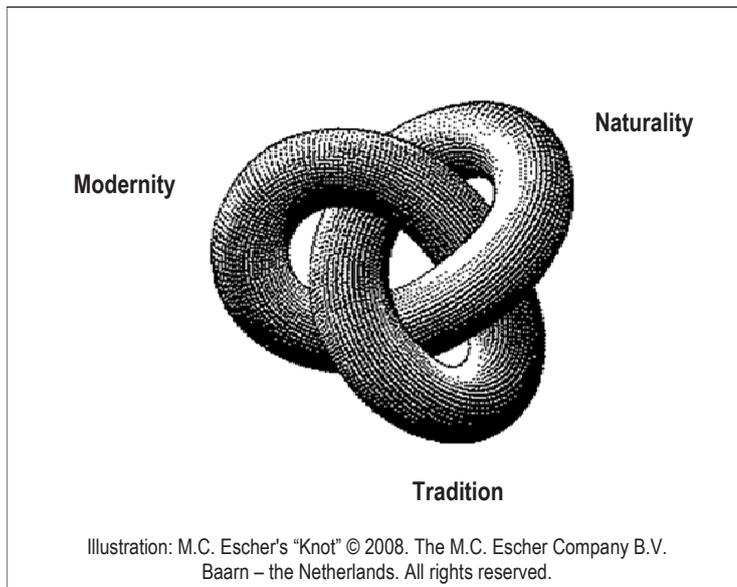


Figure 8.1 Three angles of vision underlying social perceptions of animal farming: modernity, tradition and naturality

There were also national differences in the way respondents perceived these dilemmas. Table 8.1 provides an overview of how these dilemmas are viewed in Norway and the Netherlands (see chapter six for a more detailed explanation). The most striking difference between the two countries was the position and *meaning of nature* in society. Norwegian respondents perceived rural areas as transitional areas, between nature and urban areas, while the Dutch respondents experienced rural areas as part of the 'green area' and nature. Consequently, Norwegian respondents perceived farm animals as part of the 'intermediate' areas, whereas Dutch respondents considered farm animals as part of nature. As such, Norwegians perceived a dilemma between farm specialization and the preservation of diversity and variety in farm production (a modernity-tradition dilemma), whereas the Dutch were more concerned about the effects of modernity on farm animals' naturality. In general, respondents from both countries were concerned about the loss of farming traditions, although, the Norwegians showed more concern about this than the Dutch. In both countries, farmers were considered as being at the centre of all of these dilemmas and respondents looked to them to handle these dilemmas, resolve the conflicts and maintain a desired balance between modernity, tradition and naturality.

Table 8.1 Perceived dilemmas in Norway and the Netherlands between the three angles of vision (modernity, tradition and naturality)

Country	Themes			
	Farm animals and their products	Farming practices	Rural landscape	Farmers
Norway	Modernity - Tradition	Modernity - Tradition	Modernity - Tradition Naturality - Tradition	Maintain a balance between the three
The Netherlands	Modernity - Naturality	Modernity - Tradition	Modernity - Tradition Modernity - Naturality	Maintain a balance between the three

The issues and tensions experienced by respondents differed for each of the angles and how they related to the different themes. Each angle of vision had two sides, or two different faces, the different aspects (and underlying tensions) of which are described below.

Modernity in farming describes a continuing process of rationalization, searching for the most productive and efficient farming systems by making use of high levels of technology. The *positive face* of modernity and agricultural modernization is rooted in the values of progress, efficiency and prosperity. Modernization has been highly successful in making farming systems more efficient and maximising production through the application of technology and automation and high levels of human control. On the other hand this modernity also has a *negative face* which finds expression in the loss of nature, the depletion of resources, the pollution of the environment, negative effects on animal welfare, the loss of traditional rural culture, a decrease in the diversity of landscapes and a standardization of food products. This face of modernity is often described as a threat to natural and traditional values. This negative aspect of modernity emerged as an issue in both the farm visits and the national survey (see chapter seven), both of which showed that many people considered some aspects of modern animal farming practices to be unacceptable and wanted to preserve and protect nature and animals.

Tradition also has two faces. On the *positive* side tradition is romantic, idyllic and nostalgic. When applied to animal farming it is often used to depict a situation in which humans and animals live in harmony. Studies on rurality and the countryside often refer to this as the pastoral myth or rural idyll. But, on *negative* side, tradition can also be seen as dull, backward, old-fashioned and static (see for example Rye 2006). Chapter seven showed that most people preferred relatively traditional farms, although they did not completely reject modern animal farming.

Finally, farming reflects *naturality* through its interactions with nature, animals and the soil. On the one hand naturality represents wilderness which is seen as *benign* and *Arcadian* and should be left undisturbed, free from human interference. On the other hand, nature can also be a *threat* to people

and needs to be dominated (or at least managed) by human agency. Agriculture is a prime example of humanity's success in dominating and cultivating nature for human progress. However, the very success of this process of domination puts nature under pressure giving rise to social concerns about preserving naturalness. Thomas (1983) described similar tensions and refers to the 'human dilemmas' that exist between wilderness, conservation and mercy, on the one hand, and cultivation, conquest and meat, on the other.

In general respondents did not wholly condemn modern animal farming and were not solely in favour of maintaining or creating a rural idyll. In this respect their idea of animal farming is not as black and white as is sometimes suggested. The visits and survey provided evidence that people simultaneously appreciate modernity, traditions and naturalness and are aware of the tensions and dilemmas between these three angles of vision. Collective meanings of animal farming are therefore characterized by multiple ambivalences – and are polyvalent. People expect farmers to handle the dilemmas, resolve the conflicts and maintain a desired balance between modernity, tradition and naturalness. However, they are also aware that it is often difficult to put these wishes into practice and they are willing to think about compromises.

8.4 Influencing factors

8.4.1 Knowledge and experiences

People have different perceptions about animal farming. These differences are influenced by the 'frame' through which people look at the world around them which is, in turn, influenced by several factors, such as values, convictions, knowledge and experiences. The results from two surveys carried out in the Netherlands allowed for an analysis of the effects of knowledge and experience, and of values and convictions, on people's perceptions of animal farming (chapters four and seven).

This study started from the assumption that most people today in northern Europe have little experience of, or knowledge about, agriculture (Fraser 2001, Holloway 2004). This was confirmed by findings from the Dutch national survey¹³, which showed that few people knew many of the key statistics about dairy production. However, the survey also found that half the Dutch respondents¹⁴ had visited a farm within the last two years, which challenges the assumption that very few citizens have direct experiences with

¹³ People were given 6 statements about dairy farming (e.g. the average yield of a dairy cow is x litres) and asked to judge whether these were correct, or whether the figures should be higher or lower (see also Appendix II). One point was awarded for each correct answer. Individual's total scores (ranging from 6= all answers right to 0 = all answers wrong) were calculated. Almost three quarters of respondents answered 2 or less of the questions correctly, leading to the conclusion that people's factual knowledge about dairy farming is very low.

¹⁴ 52.5% of Dutch respondents had visited a farm over the last two years and 62.5% of this group found it to be informative.

farming. Thus while people seem to have little factual knowledge about dairy farming they do have some, if limited, experiences of it.

The study showed that people with *more experience with farming* (living or growing up in rural area, work experience in agriculture or a farm visit) were better disposed to contemporary dairy farming and more accepting of modernity in the treatment of farm animals. For these people the trade off between animals' naturality and modernity was more acceptable. The results also showed people with a connection to agriculture have a more positive image of farmers and of the quality of life of farm animals (see chapter four). It also emerged that *information supply* (through for example a leaflet) could influence people's image of farmers, but not their perception of animals' life quality. It was noticeable that a large majority¹⁵ of respondents expressed no interest in receiving information about animal farming and that if the farmers' organisations or the government wishes to better inform the public about its activities, it might have to look for other methods of communication (see also section 8.5.1).

8.4.2 Values and convictions

Values provide the criteria on which people make evaluations (see also chapter one). The relationship between people's values and their opinions about animal farming were analysed using the Dutch WIN-model. This identifies eight different value-orientations¹⁶: socially-minded, caring and faithful, conservative, hedonist, materialist, professional, broadminded and balanced. The analysis confirmed that people's value-orientation influences their opinions about animal farming. The study also showed that value-orientations provide an indication of people's preferred solutions to farming dilemmas. Figure 8.2 provides an overview of the general findings from the two surveys.

The study on animal welfare showed that professionals and broadminded people thought that the quality of life of farm animals was less good compared to the caring-faithful and conservatives who thought it was better. The study on social acceptance showed that professionals and (to a lesser extent) materialists - i.e. progressive people - had a preference for more modern, and less traditional and natural, dairy farms, and accepted most modern approaches towards the use of living materials (farm practices and farm animals). By contrast, socially-minded people and (to a lesser extent) conservative, caring and faithful people and hedonists expressed stronger preferences for traditional and natural dairy farms and were less accepting of modern approaches towards the use of living materials.

¹⁵ 84.7 % of Dutch respondents said that they had no interest in receiving information about animal farming.

¹⁶ Values form the basis of how people look at the world and how they make evaluations between 'good' and 'bad'. A value-orientation is the set of values that people consider to be the most important in their lives. This thesis made use of the WIN-model which has eight categories (see also chapters one, four and seven).

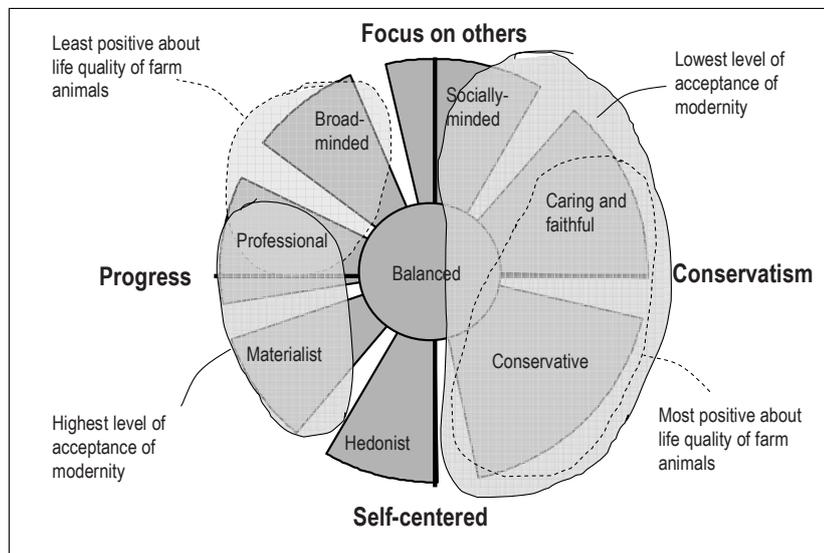


Figure 8.2 Eight value-orientations and their perception of animal welfare (---) and acceptance of modernity in animal farming (—)

In general progressive people appeared to believe that technological solutions had a potential to improve the life quality of farm animals, whereas conservative people preferred a more traditional and natural farm. The latter group is more averse to modernity and is unlikely to be in favour of solutions that rely upon technological innovations.

In addition to values, *convictions* about humans' relationship with nature and animals also played a role in influencing people's perceptions. The findings showed that most Dutch respondents believed that humans should live in harmony with nature, and only a minority that humans should dominate nature. The study also showed that there is a majority opinion among Dutch citizens that humans are superior to animals and that human life is of more value than animal life. People who believed in harmonious human-nature relationships and in egalitarian human-animal relationships showed a preference for more traditional and natural dairy farms and were less accepting of modernity in farm practices and the treatment of farm animals.

Finally, the findings showed that age influences people's perceptions of animal farming. Elderly people (older than 65 years) were more satisfied with contemporary dairy farming, were more accepting of modern methods of treating farm animals and expressed less desire for traditional and natural dairy farms than younger generations.

8.5 Social acceptance of future developments in livestock systems

In recent years, farmers, politicians and (animal) scientists have become increasingly concerned about the *social acceptance* of livestock systems (Kanis *et al.* 2003). This section reflects on some implications of this study for the social acceptance of future developments in livestock systems. Kanis *et al.* (2003) argue that there are two ways of making animal farming systems (more) socially acceptable: adjusting public opinion or adjusting/re-designing the livestock farming system. While this distinction appears quite simplistic it is useful to look at the problem from these two sides.

8.5.1 Influencing public opinion

It has often been stated that the public lacks knowledge about (animal) farming and should be better informed about the realities of contemporary animal farming (e.g. Fraser 2001, Holloway 2004, Kanis *et al.* 2003). The general expectation of such arguments is that more information would make animal farming more socially acceptable. The quantitative parts of this study do show that people with more knowledge about and/or experiences with farming have more positive perceptions of animal farming and are more accepting of modern ways of treating farm animals. It also showed that almost two-thirds¹⁴ of the respondents who had visited a farm over the last two years considered the visit informative, showing that farm visits can play an important role in teaching people what farming actually entails and expanding their knowledge.

However, informing the general public about animal farming is not as easy or self-evident as it may seem. The results of this study showed that more information only influenced people's images of farmers, but did not affect their opinions about other aspects of animal farming, such as animal welfare. Hence, the effect of supplying factual knowledge, through information campaigns or newsletters might have only a limited and selective impact. More importantly the study showed that a large majority¹⁵ of people are not interested in receiving information about animal farming. Equally such information campaigns might only have a limited effect, as people's opinions about animal farming are strongly influenced by their value-orientations, which are relatively stable and difficult to change. General information campaigns are therefore likely to only have a very limited effect in influencing social opinions about, and acceptance of, modern animal farming systems. However, such campaigns can make use of the knowledge that people's perceptions are influenced by their value-orientation, as this shows the issues that specific groups are sensitive to. On this basis targeted information could be aimed at specific value-orientation-groups to address the fundamental values that shape their concerns. For example, professionals are least positive about animal welfare, but at the same time show the highest level of acceptance of modernity. They may be more supportive of solutions to improve animal welfare through

technological innovation.

One can also question the motives or intended purpose of supplying more information. In general, it is considered important that people know where their food comes from and how it is produced. Supplying information about animal farming and food production can, in this sense, be a way of increasing people's knowledge of these issues. But most often the purpose of information supply is to *positively influence* people's opinions about animal farming - based on the idea that the public has negative 'misconceptions' about animal farming. However, general information campaigns can also 'backfire': they might lead people to become more concerned or have less positive perceptions about animal farming. Equally an unbalanced approach can smack of propaganda or manipulation and this raises ethical questions (Termeer and Koppenjan 1997) over the extent to which public perceptions should be influenced, who is entitled to do so (farmers, scientists, politicians, etc) and whose presentation of farming reality should be adopted (e.g. animal right organizations, farmers' organizations, research institutes or the government).

To conclude, even though 'informing the general public' is often put forward as the solution to make animal farming systems more socially acceptable, the issues and arguments raised above make it evident that this is not as simple and clear cut as it may first seem.

8.5.2 System innovations

The other approach involves taking social perceptions into account when (re)designing animal farming systems. While it would require a conversion to apply the (theoretical) findings of the present study to actual system innovations (i.e. to translate modernity, tradition and naturality into practical solutions at the farm level) the socio-cultural issues identified in chapter five can be of use since they refer to relatively concrete examples. The Dutch project 'Cow Power' (Bos *et al.* 2009) is one of the first dairy farming projects which studied citizens' priorities and wishes, so as to include them in designs of dairy farming systems. This project illustrates some of the challenges of translating citizens' perceptions into actual system innovations.

The Cow Power project was commissioned by the Dutch Minister of Agriculture, Nature Management and Food Quality, who expressed the wish that animal farming should become more sustainable and command broader social acceptance (*'een breed draagvlak in de samenleving'*) by 2023. The project sought to cover the requirements of four stakeholders: the animals, the environment, the farmers and the public. For the practical purposes this summary only examines the findings related to the

requirements of the public (as reported in Bos and Van Eijk 2009). This study examined the public's attitudes towards, and priorities for, dairy farming by means of semi-quantitative interviews with a sample of 98 Dutch people. The findings describe three underlying tensions or dilemmas in animal farming: exploitation versus respect, economic rationality versus living harmoniously together and unregulated freedom versus secure production conditions (Bos and Van Eijk 2009).

These dilemmas closely resemble the tensions between the different faces of modernity, tradition and naturality, discussed in this thesis (see also Table 8.2). Exploitation forms part of the negative face of modernity (human domination over nature), whereas respect for nature is part of the Arcadian face of naturality. Economic rationality is part of modernity: it can be positive (in the sense of efficiency and profit maximization), but can also be negative (in the sense that farm animals become mere factors of production). Such rationality contrasts with the idyllic face of tradition, living together harmoniously. Finally, one can connect unregulated freedom to tradition in a positive sense (the past was better with fewer rules) or a negative sense (uncontrolled farming practices allow unprofessional and messy behaviour). By contrast secure production conditions can be seen as modernity's positive face: for example certified food production contributes to increased food safety.

Table 8.2 Overlap between the three dimensions of the public's views (in Cow Power) and dilemmas between modernity, tradition and naturality (this thesis)

	Cow Power	This thesis
Dimension 1	Exploitation vs. respect	Modernity vs. naturality
Dimension 2	Economic rationality vs. living harmoniously	Modernity vs. tradition
Dimension 3	Unregulated freedom vs. secured production conditions	Tradition vs. modernity

However, this thesis also shows that citizens' wishes can differ from their level of acceptance. In an ideal world people might prefer a traditional and natural way of animal farming (which suggests that they reject modern developments), yet in reality people make trade-offs between different aspects of animal farming, since they are aware that their wishes are difficult to achieve. They may accept certain developments which are less desirable, depending on the trade-off. Hence, in seeking to design farming systems that take account of social perceptions, choices have to be made over which aspects are the most important. To address this issue the Cow Power project asked panellists to rank the most positive characteristics of a dairy farm and included the 11 most highly ranked characteristics in the designs. Although this participatory process appears to be a fair way to prioritize societal issues, it should be noted that the result is a single list, taken as representing 'public opinion.' Yet, this study shows that there are (substantial) differences between the opinions of different groups of people.

The Cow Power project sought to address this problem and distinguished between three groups of people¹⁷, although the final ranking was based on the priorities of one group (the romantics) as it was assumed that the other groups would not disagree with these requirements. However, it is likely that the two other groups would prioritize different aspects of dairy farming, since they have different convictions about human-animal relationships and most likely a different value-orientation. Values and convictions both influence what people consider as an issue and where they search for a solution. Consequently different groups of people might set different priorities and make different trade-offs, resulting in different lists of most important aspects. In future studies about system innovations it would be interesting to take a closer look at the differences between (groups) of people and the resultant priorities.

8.6 Implications for future research on sustainability

The final section of this chapter elucidates five implications for future research on sustainability and makes a number of suggestions as to how the findings and experiences of this thesis could be further developed in future research.

The main aim of this thesis has been to gain insights into the socio-cultural sustainable development of animal farming systems. As such it focuses on the (often neglected) 'S' of the EES (Economic, Environmental and Social) pillars that, together, define and create sustainable development. This pillar is defined by public perceptions of animal farming and includes the underlying meanings of animal farming which are derived from socio-cultural contexts. The study has shown that citizens in north-western Europe see animal farming as having three aspects: tradition, naturality and modernity. To be sustainable from a socio-cultural perspective, animal farming needs to combine 'the best' of these three worlds. People's views about the best modern developments, important farming traditions and valuable aspects of nature are culturally defined and context-dependent. They reflect the underlying collective meanings attached to animal farming. Hence, the definition of 'the best' can differ between countries. In the Netherlands, it includes, for example, grazing cows but also automatic feeding devices. However these national views are not homogenous and the study also reveals that different groups of people hold different perceptions and views of animal farming. People's values, convictions, knowledge and experiences can lead them to favour more modern, more traditional or more natural farms. Consequently, socio-cultural perspectives of the sustainability of animal farming vary, not only between countries, but also between groups of people.

¹⁷ 'Pragmatics' (35%) place humans above animals, 'Romantics' (50%) are in search for harmony between humans and animals and 'Ethics' (15%) base their views about the use of animals on a very ethical basis.

Moreover views about 'the best' economic and environmental aspects of farming are culturally defined and context dependent. As such, socio-cultural sustainability stretches beyond the 'S' of the EES-concept - in the sense that sustainable development itself is socially and culturally constructed.

The social construction of sustainability (whether of animal farming or other phenomena) is derived from a set of collective meanings which define what is considered to be sustainable and unsustainable (see for example Redclift and Woodgate 1997, Klostermann and Cramer 2007). This constructivist line of thought has (at least) three implications for the way one *approaches* sustainable development, namely:

- It implies acknowledging that sustainable development has different meanings
- It implies acknowledging that sustainable development is a value-laden concept
- It implies incorporating both unsustainable and sustainable aspects

This in turn has three implications for the way in which one *studies* sustainable development, namely:

- It implies a focus on conceptual as well as material elements
- It implies a need for interdisciplinary research
- It implies a need for new research methods

These findings have several important implications for future research on sustainable development. Firstly, they highlight that sustainable development has *multiple meanings*, which are based on what is generally believed to be sustainable (or not) in a certain context. In other words the meaning of sustainable development is context-dependent. Context is a broad term and can refer to different regions or cultures - as in this case the differences between Norway and the Netherlands - but it can also refer to the role of people within society i.e. as an academic, policymaker, farmer or lay person. Other studies have shown that the general public understands and describes sustainable development very differently from scientists or legislators (Blatz 1992, Macnaghten and Jacobs 1997). The present study also found such differences over how sustainable animal farming is viewed. While scientists and politicians often divide sustainable development into three pillars (the EES-concept), the general public does not make such a distinction. Instead they were looking for a balance between modernity, tradition and naturality. With regard to the context-dependency, this thesis was bound by a specific context – that of dairy farming in the Netherlands and Norway. Future research, focused on other contexts (such as more intensive farming systems or in other countries and cultures) might reveal different criteria for evaluating sustainability – or different tensions and balances.

The different perceptions of sustainable development are strongly influenced by *values*, and many

disagreements about sustainable development may well come down to deep differences in values (Sumner 2005). The value laden nature of the concept of sustainable development implies the need for an ongoing debate about what is considered sustainable and what is not, as human values and needs can shift.

Many sustainability studies focus on what is considered to be unsustainable in order to make a situation more sustainable. This has led, for example to the development of an enormous amount of sustainability indicators which measure 'unsustainability' (Redclift and Woodgate 1997). However, collective meanings of sustainable development include both sustainable and unsustainable aspects, as this study of livestock farming systems has shown and one should take care not to lose sight of valuable aspects (i.e. positive aspects, non-concerns). This study has identified issues (or concerns) but has also showed that people recognise and appreciate aspects of animal farming and think that it is important to maintain these in the future. For example, people appreciated the appearance of present-day farm yards, including the farm house, the garden and the sheds. Such aspects should be taken into consideration in future studies: where the positive aspects of existing systems should be taken into account when designing and applying sustainability indicators and making trade-offs.

When studying sustainable development as a social construction, it is important to take into account one important limitation of the constructivist approach: that it often only focuses on the meaning of phenomena and as such tends to ignore the material world (Van Eijk 1998, Demeritt 2002, Castree and Braun 2006). Consequently, one should not only ask what sustainable development *means*, but also *what* is to be sustained (Redclift and Woodgate 1997). The social construction of sustainable development is a process of interaction between the *conceptual* element (e.g. collective meanings of a farming system) and the *material* element (e.g. a farming system itself). Research on sustainable development should therefore focus on both elements and the interactions between them.

In research into animal farming, knowledge about these two aspects is divided between two disciplines, with rural sociologists having expertise on the conceptual element - meanings of the rural - and animal scientists being more engaged with the material element - e.g. technological solutions within animal farming systems (see also chapter two). *Interdisciplinary research* is required to gain a better understanding of the interactions between the conceptual and material elements of animal farming. This implies a shift in thinking within both disciplines. Even though it is not easy for scientists to change their thinking, due to deeply rooted values and assumptions (Van Eijk 1998, Hodges 2003), changes are gradually taking place in both disciplines. Within animal science, the social and cultural meanings of

animal farming are increasingly acknowledged as important components in the sustainable development of livestock farming systems. Within rural sociology, studies on human-animal relationships are opening up new lines of interest that focus on, for example, farm animals and their 'materiality'.

This said, the constructivist approach allows possibilities for developing *new research methods* to study the sustainable development of animal farming systems. This thesis has studied the socio-cultural sustainable development of animal farming by looking at people's on-farm sensory perceptions. The method gave insights into how people give meaning to the world around them. It also opened up the possibility of including both the material and conceptual elements of the social construction, with the farm visits giving people a real life experience of the material world of animal farming. People's perceptions were constructed in interaction with what they actually saw, heard, smelt and felt - the material reality – their perceptions therefore were more than just mental constructs of reality.

Although the method appeared fruitful for this thesis, it met with three main difficulties, which should be taken into account when studying social perceptions through analysing real life and sensory experiences. First of all, some issues – for example environmental issues and the use of land in developing countries for fodder production – were not addressed by respondents. Such global and environmental issues (e.g. nutrient flows) are not revealed by direct perception (Carolan 2006). In future research it might be informative to cover such issues in another way, for example through focus group discussions or by conducting visits to other parts of the production chain (e.g. the feed industry). Second, in this thesis the method was applied at the farm level – it could also be fruitful to study social perceptions of animal farming at other system levels, for example by making a regional tour that could extend the experience from the farm yard to regional level. Finally, this thesis analysed people's sensory perceptions in jointly, without differentiating between them. Other studies show that each sense can connect to different meanings. For example, smell is strongly related to memories (e.g. Tuan 1974). Future research might therefore find it helpful to develop the analysis further by, for example, looking more specifically at the contribution of each sense to the construction of meaning.

8.7 Main conclusions

1. The 'S' of the EES-concept (Economic, Environmental and Social), which describe the three pillars of sustainability is defined by public perceptions of animal farming and includes the underlying meanings of animal farming which stem from socio-cultural contexts.
2. Sustainable development is socially and culturally constructed, which implies acknowledging that sustainable development has different meanings, is a value-laden concept and that both unsustainable and sustainable aspects should be incorporated.
3. Socio-cultural issues of dairy farming in the Netherlands and Norway cover a wide variety of themes, and people's concerns about animal farming extend beyond animal welfare.
4. Collective views of animal farming in the Netherlands and Norway can be categorized in three angles of vision – modernity, tradition and naturality – with each having two different faces:
Modernity represents the values of progression, efficiency and prosperity, but it can also be a threat to natural and traditional values.
Tradition can be seen as romantic, idyllic and nostalgic, but it can also be seen as dull, backward, old-fashioned and static.
Naturality can be seen as benign and Arcadian, free from human interference, but it can also be seen as a threat to people, and requiring domination (management) by human agency.
5. Socio-cultural sustainable animal farming systems need to combine 'the best' of three worlds; modernity, tradition and naturality. However, 'the best' is culturally defined and context-dependent and can differ between countries, regions and groups of people.
6. Dutch and Norwegian respondents simultaneously appreciate modernity, traditions and naturality and are also aware of the tensions and dilemmas between these three angles of vision. They expect farmers to handle these dilemmas, resolve the conflicts and maintain a desired balance between modernity, tradition and naturality. However, they are also aware that it is often difficult to put these wishes into practice and they are willing to think about compromises.
7. The most striking difference between the Netherlands and Norway was the meaning of nature in society. Norwegian respondents perceived rural areas as transitional areas, between nature and

urban areas, while Dutch respondents experienced rural areas as part of the 'green area' and of nature.

8. Dutch citizens with more experience with farming (living or growing up in rural area, work experience in agriculture or a farm visit) were better disposed to contemporary dairy farming and more accepting of modernity in the treatment of farm animals.
9. Value-orientations influenced people's level of acceptance and perception of dairy farming in the Netherlands: professionals and (to a lesser extent) materialists and progressive people had a preference for less traditional and natural, dairy farms, and accepted more modern approaches towards the use of living materials than socially-minded people and (to a lesser extent) conservative, caring and faithful people and hedonists.
10. Convictions about humans' relationship with nature and animals influenced people's level of acceptance and perceptions of dairy farming in the Netherlands: people who believed in harmonious human-nature relationships and in egalitarian human-animal relationships showed a preference for more traditional and natural dairy farms and were less accepting of modernity in farm practices and the treatment of farm animals.
11. 'Informing the general public' is often proposed as a way of making animal farming systems more socially acceptable, but it is not as self-evident as it may seem because a) a large majority (85%) of Dutch respondents expressed no interest in receiving information about animal farming and b) values and convictions play a key role in shaping attitudes and these are relatively stable and difficult to change.
12. Different people have different priorities and favour different trade-offs in the design of animal farming systems. Attempts at designing animal farming systems so they incorporate public perceptions and wishes need to recognise that different groups of people have different priorities. Future studies about system innovations should therefore more closely examine the differences between (groups) of people and their priorities.
13. An inquiry into sustainable development as a social construction implies a focus on conceptual as well as material elements, a need for interdisciplinary research and a need for new research methods.

References

- Aarts, M.N.C., Hanning, C., 2001. *Hoe oordelen we over de veehouderij?* Rathenau Instituut, Den Haag, the Netherlands.
- Aarts, M.N.C., Te Velde, H., 2001. Eten, maar niet willen weten. In: Aarts, M.N.C., Hanning, C. (Eds.), *Hoe oordelen we over de veehouderij?* Rathenau Instituut, Den Haag, the Netherlands.
- Aarts, M.N.C., Van Woerkum, C., 2002. Dealing with uncertainty in solving complex problems. In: Leeuwis, C., Pyburn, R., Röling, N. (Eds.), *Wheelbarrows full of frogs: social learning in rural resource management : international research and reflections*. Koninklijke Van Gorcum, Assen, the Netherlands.
- Aarts, M.N.C., Van Woerkum, C.M.J., 2006. Frame Construction in Interaction, 112th MOPAN International Conference. Short run Press, Exeter, Pontypridd, UK.
- Aarts, M.N.C., Van Woerkum, C.M.J., 1994. *Wat heet natuur? De communicatie tussen overheid en boeren over natuur en natuurbeleid*. Landbouwniversiteit, Wageningen, the Netherlands.
- Abram, S., 2003. The rural gaze. In: Cloke, P. (Ed.), *Country Visions*. Harlow, Pearson, UK.
- Abramson, P.R., Ellis, S., Inglehart, R., 1997. Research in context: Measuring value change. *Political Behavior*, 19, 41-59.
- Alrøe, H.F., Kristensen, E.S., 2002. Towards a systemic research methodology in agriculture: Rethinking the role of values in science. *Agriculture and Human Values*, 19, 3-23.
- Annevelink, E., Vink, A., Schouten, W.G.P., Smits, A.C., Hemming-Hoffmann, S., Lamaker E.J.J., Groot Koerkamp, P.W.G., 2003. Food park, a case study of an integrated sustainable agro production park system designed with agro innovation framework. In: *Fourth European Conference of the European Federation for Information Technology in Agriculture, Food and the Environment*, 90 - 96.
- Assefa, G., Frostell, B., 2007. Social sustainability and social acceptance in technology assessment: A case study of energy technologies. *Technology in Society*, 29, 63.
- ATLAS.ti – *The QDA software*, 2006. Berlin, Germany. www.atlasti.com.
- Barnett, C., 1998. The cultural turn: fashion or progress in human geography? *Antipode*, 30, 379-394.
- Becker, J.W., Van Enckevort, G.M.W., Enschede, C.J., 1983. *Normen en waarden: verandering of verschuiving?* Vuga, Den Haag, the Netherlands.
- Beilin, R., 2005. Photo-elicitation and the agricultural landscape: 'seeing' and 'telling' about farming, community and place. *Visual Studies*, 20, 56-68.
- Bell, D., 2006. Variations on the rural idyll. In: Cloke, P.J., Marsden, T. (Eds.), *Handbook of Rural Studies*. Sage, London, UK.
- Bell, S., Morse, S., 1999. *Sustainability indicators: measuring the immeasurable?* Earthscan, London, UK.
- Bennett, R.M., 1997. Farm animal welfare and food policy. *Food Policy*, 22, 281-288.
- Berger, P.L., Luckmann, T., 1967. *The Social Construction of Reality: A treatise in the sociology of knowledge*. Anchor, New York, US.
- Bieleman, J., 1998. Boeren met machines. Het melkveehouderijbedrijf. In: *Techniek in Nederland in de twintigste eeuw*, Schot, J. W. De la Bruhèze, A. A. A. (Eds). Stichting Historie der Techniek, Eindhoven, the Netherlands, 99-126.
- Blatz, C.V., 1992. The very idea of sustainability. *Agriculture and Human Values*, 9(4), 12-28.
- Boghossian, P.A., 2001. What is social construction? *Times Literary Supplement*, February 2001.
- Bonne, K., Verbeke, W., 2008. Religious values informing halal meat production and the control and delivery of halal credence quality. *Agriculture and Human Values*, 25, 35-47.
- Boogaard, B.K., 2006. *Met burgers de boer op! Resultaten van bedrijfsbezoeken*, Animal Production Systems Group, Wageningen, the Netherlands.
- Boogaard, B.K., Oosting, S.J., Bock, B.B., 2008. Defining sustainability as a socio-cultural concept: Citizen panels visiting dairy farms in the Netherlands. *Livestock Science*, 117, 24-33.
- Boogaard, B.K., Oosting, S.J., Bock, B.B., 2006. Elements of societal perception of farm animal welfare: A quantitative study in the Netherlands. *Livestock Science*, 104, 13-22.
- Bos, B., Cornelissen, J.M.R., Groot Koerkamp, P.W.G., 2009. *Cow Power – Designs for system innovation*. Wageningen UR, Lelystad, the Netherlands.

References

- Bos, B., Groot Koerkamp, P.W.G., Groenestein, K., 2003. A novel design approach for livestock housing based on recursive control - with examples to reduce environmental pollution. *Livestock Production Science*, 84, 157-170.
- Bos, B., Van Eijk, O., 2009. *Programma van Eisen van de burger / consument met betrekking tot de melkveehouderij*. Wageningen UR, Lelystad, the Netherlands.
- Brown, B.J., Hanson, M.E., Liverman, D.M., Meredeth Jr, R.W., 1987. Global sustainability: Toward definition. *Environmental Management* 11, 713-719.
- Brundtland, G.H., 1987. *Our common future*. World Commission on Environment and Development. Oxford University Press, Oxford, UK.
- Buller, H., 2004. Where the wild things are: The evolving iconography of rural fauna. *Journal of Rural Studies*, 20, 131-141.
- Buller, H., Morris, C., 2003. Farm animal welfare: A new repertoire of nature-society relations or modernism re-embedded? *Sociologia Ruralis*, 43, 216-237.
- Bunce, M., 2003. Reproducing rural idylls. In: Cloke, P. (Ed.), *Country Visions*. Pearson, Harlow, UK.
- Burgess, D., Hutchinson, W.G., 2005. Do people value the welfare of farm animals? *EuroChoices*, 4, 36.
- Carolan, M.S., 2006. Do you see what I see? Examining the epistemic barriers to sustainable agriculture. *Rural Sociology*, 71(2), 232-260
- Carolan, M.S., 2007. Introducing the concept of tactile space: Creating lasting social and environmental commitments. *Geoforum*, 38(6), 1264-1275.
- Carolan, M.S., 2008a. More-than-representational knowledge/s of the countryside: How we think as bodies. *Sociologia Ruralis*, 48, 408-422.
- Carolan, M.S., 2008b. When good smells go bad: A sociohistorical understanding of agricultural odor pollution. *Environment and Planning A*, 40, 1235-1249.
- Castree, N., Braun, B., 2006. Constructing rural natures. In: Cloke, P.J., Marsden, T. (Eds.), *Handbook of Rural Studies*. Sage, London, UK.
- CBS, 2007a. Centraal Bureau voor de Statistiek, Statistics Netherlands. *Statline 2003*. <http://www.cbs.nl>, <http://statline.cbs.nl>.
- CBS, 2007b. Centraal Bureau voor de Statistiek, Statistics Netherlands. *Statline 2005*. <http://www.cbs.nl>, <http://statline.cbs.nl>.
- CBS, 2007c. Centraal Bureau voor de Statistiek, Statistics Netherlands. *Statline 2007*. <http://www.cbs.nl>, <http://statline.cbs.nl>.
- Cloke, P., 1997. Country backwater to virtual village? Rural studies and 'the cultural turn'. *Journal of Rural Studies*, 13(4), 367-375.
- Cloke, P., 2003a. *Country Visions*. Pearson, Harlow, UK.
- Cloke, P., 2003b. Knowing ruralities? In: Cloke, P. (Ed.), *Country visions*. Pearson, Harlow, UK.
- Cloke, P., 2006. Conceptualizing rurality. In: Cloke, P.J., Marsden, T. (Eds.), *Handbook of Rural Studies*. Sage, London, UK.
- Cloke, P.J., Marsden, T., 2006. *Handbook of Rural Studies*. Sage, London, UK.
- Cornelissen, A.M.G., 2003. *Two faces of sustainability: Fuzzy evaluation of sustainable development*. PhD-thesis, Wageningen University, Wageningen, the Netherlands.
- Cornelissen, A.M.G., Koops, W.J., Van den Berg, J., Kaymak, U., 2003. Elicitation of expert knowledge for fuzzy evaluation of agricultural production systems. *Agriculture, Ecosystems and Environment*, 95, 1-18.
- Cornelissen, A.M.G., Van den Berg, J., Koops, W.J., Grossman, M., Udo, H.M.J., 2001. Assessment of the contribution of sustainability indicators to sustainable development: a novel approach using fuzzy set theory. *Agriculture, Ecosystems and Environment*, 86, 173-185.
- Crossley, N., 2005. Sociology and the body. In: Calhoun, C., Rojek, C. (Eds.), *The Sage Handbook of Sociology*. Sage, London, UK.
- Dagevos, H., Sterrenberg, L., 2003. *Burgers en consumenten: tussen tweedeling en twee-eenheid*. Wageningen Academic Publishers, Wageningen, the Netherlands.
- Dahlberg, K.A., 1988. Ethical and value issues in international agricultural research. *Agriculture and Human Values*, 5, 101-111.
- Daugstad, K., Rønningen, K., Skar, B., 2006. Agriculture as an upholder of cultural heritage? Conceptualizations and value judgements - a Norwegian perspective in international context. *Journal of Rural Studies*, 22(1), 67-81.

-
- Demeritt, D., 2002. What is the 'social construction of nature'? A typology and sympathetic critique. *Progress in Human Geography*, 26, 767-790.
- Dewulf, A., Gray, B., Putnam, L., Aarts, N., Lewicki, R., Bouwen, R., Van Woerkum, C., 2005. *Disentangling approaches to framing: mapping the terrain*. Conference of the International Association for Conflict Management (IACM), Seville, Spain.
- Doerfler, R.L., Peters, K.J., 2006. The relativity of ethical issues in animal agriculture related to different cultures and production conditions. *Livestock Science*, 103, 257-262.
- Dubois, J.L., Mahieu, F.R., Poussard, A., 2002. *Social Sustainability as a component of human development*. Workshop: Poverty, Social Capital and Development., Von Hugel Institute, St. Edmunds' College, Cambridge University, UK.
- Eder, K., 1996. *The Social Construction of Nature: a sociology of ecological enlightenment*. Sage, London, UK.
- Emel, J., Wilbert, C., Wolch, J., 2002. Animal geographies. *Society and Animals*, 10, 407-412.
- Engel, J.F., Blackwell, R.D., Miniard, P.W., 1993. *Consumer behavior*. Dryden, Fort Wort, US.
- Eurobarometer, 2005. Attitudes of consumers towards the welfare of farmed animals. *Special Eurobarometer 229*. European Commission.
- Evers, J.C., Boog, B.W.M., 2001. *Introduction to Atlas/ti. KWALON course*. SISWO Instituut voor Maatschappijwetenschappen, the Netherlands.
- Farshad, A., Zinck, J.A., 1993. Seeking agricultural sustainability. *Agriculture, Ecosystems and Environment*, 47, 1-12.
- Fauconnier, G., Van Woerkum, C.M.J., Marck, P., 1992. *Beeldvorming over de landbouw*. CLEO, Heverlee, Belgium.
- Field, A., 2000. *Discovering statistics using SPSS for Windows: advanced techniques for the beginner*. Sage, London, UK.
- Field, A., 2008. *Discovering Statistics Using SPSS*. Second edition. Sage, London, UK.
- Franklin, A., 1999. *Animals and Modern Cultures: a sociology of human - animal relations in modernity*. Sage, London, UK.
- Fraser, D., 2001. The "new perception" of animal agriculture: legless cows, featherless chickens, and a need for genuine analysis. *Journal of Animal Science*, 79, 634-641.
- Frerichs, R., De Wijs, J., 2002. *Opvattingen en meningen over het Nederlandse platteland*. The Dutch Institute for Public Opinion, Amsterdam, the Netherlands.
- Fresco, L.O., Kroonenberg, S.B., 1992. Time and spatial scales in ecological sustainability. *Land Use Policy*, 9, 155-168.
- Frewer, L.J., Kole, A., Van de Kroon, S.M., De Lauwere, C., 2005. Consumer attitudes towards the development of animal-friendly husbandry systems. *Journal of agricultural and environmental ethics*, 18, 345-367.
- Frouws, J., 1998. The contested redefinition of the countryside. An analysis of rural discourses in the Netherlands. *Sociologia Ruralis*, 38, 21-68.
- Giddings, B., Hopwood, B., O'Brien, G., 2002. Environment, economy and society: Fitting them together into sustainable development. *Sustainable Development*, 10, 187-196.
- Greider, T., Garkovich, L., 1994. Landscapes: the social construction of nature and the environment. *Rural Sociology*, 59, 1-24.
- Gullestad, M., 1992. Peace and quiet. In: Gullestad, M. (Ed), *The Art of Social Relations*, Scandinavian University Press, Oslo, Norway, 137 - 164.
- Haartsen, T., Groote, P., Huigen, P.P.P., 2003a. Measuring age differentials in representations of rurality in the Netherlands. *Journal of Rural Studies*, 19, 245-252.
- Haartsen, T., Huigen, P.P.P., Groote, P., 2003b. Rural areas in the Netherlands. *Tijdschrift voor Economische en Sociale Geografie*, 94(1), 129-136.
- Hall, S., 1997. *Representation: Cultural representations and signifying practices*. Sage, London, UK.
- Hall, C., McVittie, A., Moran, D., 2004. What does the public want from agriculture and the countryside? A review of evidence and methods. *Journal of Rural Studies*, 20, 211-225.
- Hansen, J.W., 1996. Is agricultural sustainability a useful concept? *Agricultural Systems*, 50, 117-143.
- Hansen, J.W., Jones, J.W., 1996. A systems framework for characterizing farm sustainability. *Agricultural Systems*, 51, 185-201.
- Harger, J.R.E., Meyer, F.M., 1996. Definition of indicators for environmentally sustainable development. *Chemosphere*, 33, 1749-1775.

- Harper, G., Henson, S., 2001. *Consumer Concerns About Animal Welfare And The Impact On Food Choice*. Final report. Centre for Food Economics Research, The University of Reading, Reading, UK.
- Harrington, L., 1995. Sustainability in perspective: strengths and limitations of farming systems research in contributing to a sustainable agriculture. *Journal of Sustainable Agriculture*, 5, 41-59.
- Hemsworth, P.H., Coleman, G.J., 1998. *Human-livestock interactions: the stockperson and the productivity and welfare of intensively farmed animals*. CAB International, Wallingford.
- Hervieu, B., Hansen, B., 2002. *How can research on food and agriculture in Europe better respond to citizens' expectations and demands?* Science for society - Science with society, Brussels, Belgium.
- Hessing-Couvret, E., Reuling, A., 2002. *Het WIN-model™. Waardensegmenten in Nederland*. The Dutch Institute for Public Opinion, Amsterdam, the Netherlands.
- Hessing-Couvret, E., Reuling, A., Mulder, S., 2003. *Het WIN-model. Een segmentatie van de Nederlandse bevolking*. The Dutch Institute for Public Opinion, Amsterdam, the Netherlands.
- Hilhorst, M., Verhulst, D., 2007. *Sociaal culturele duurzaamheid van melkveehouderijen. Veldwerkverantwoording Bureau Veldkamp*, Amsterdam, the Netherlands.
- Hodges, J., 2003. Editorial: Science, scientists and values. *Livestock Production Science*, 82, 259 - 264.
- Hodges, J., 2006. Culture, values and ethics of animal scientists. *Livestock Science*, 103, 263-269.
- Hofstede, G., 1980. *Culture's consequence : international differences in work-related values*. Sage Publications, Beverly, US.
- Hofstede, G., 2001. *Culture's consequences: comparing values, behaviors, institutions, and organizations across nations*. Sage, Thousand Oaks, US.
- Hofstede, G., Hofstede, G.J., 2005. *Cultures and organizations: software of the mind*. McGraw-Hill, New York, US.
- Højring, K., Noe, E., 2004. Communicative approaches to involving farmers in protecting aesthetic and biological landscape quality. *XI World Congress of Rural Sociology*, Trondheim, Norway.
- Holloway, L., 2004. Showing and telling farming: Agricultural shows and re-imaging British agriculture. *Journal of Rural Studies*, 20, 319-330.
- Holloway, L., 2007. Subjecting cows to robots: Farming technologies and the making of animal subjects. *Environment and Planning D: Society and Space*, 25(6), 1041-1060.
- Horton, J., 2003. Different genres, different visions? The changing countryside in post-war British children's literature. In: Cloke, P. (Ed.), *Country Visions*. Pearson, Harlow, UK.
- Inglehart, R., 1977. *Silent revolution: Changes values and political styles among Western publics*. Princeton University Press, Princeton, US.
- Inglehart, R., 1997. *Modernization and postmodernization: cultural, economic, and political change in 43 societies*. Princeton University Press, Princeton, US.
- Inglehart, R., Oyserman, D., 2004. Individualism, autonomy, self-expression. The human development syndrome. In: Vinken, H., Soeters, J. (Eds.), *Comparing cultures: dimensions of culture in a comparative perspective*. Brill, Leiden, the Netherlands, 74-96.
- Jackson, M., 1989. *Paths Toward a Clearing: Radical Empiricism and Ethnographic Inquiry*. Indiana University Press, Indiana, US.
- Jacobs, M., 2006. The production of mindscapes: a comprehensive theory of landscape experience. PhD-thesis. Wageningen University, Wageningen, the Netherlands.
- Jager, H.d., Mok, A.L., 1999. *Gezichtspunten en begrippen. Grondbeginselen der sociologie*. EPN Educatieve Partners Nederland, Houten, the Netherlands.
- Jager, H.d., Mok, A.L., Sipkema, G., 2004. *Grondbeginselen der sociologie*. Wolters-Noordhoff, Groningen, the Netherlands.
- Jagodzinski, W., 2004. Methodological problems of value research. In: Vinken, H., Soeters, J. (Eds.), *Comparing Cultures: Dimensions of culture in a comparative perspective*. Brill, Leiden, the Netherlands, 97-121.
- James, H.S., 2006. Sustainable agriculture and free market economics: Finding common ground in Adam Smith. *Agriculture and Human Values*, 23, 427-438.
- Jókövi, E.M., 2000. *Recreatie van Turken, Marokkanen en Surinamers in Rotterdam en Amsterdam*. Alterra, Wageningen, the Netherlands.
- Jolly, L., Krogh, E., Nergaard, T., Parow, K., Verstad, B., 2004. The Farm as a Pedagogical Resource. *6th European Symposium on Farming and Rural Systems Research and Extension*, Vila Real, Portugal.
- Jones, O., 1995. Lay discourses of the rural: developments and implications for rural studies. *Journal of Rural Studies*, 11, 35-49.

- Jones, O., 2006. Non-human rural studies. In: Cloke, P.J., Marsden, T. (Eds.), *Handbook of Rural Studies*. Sage, London, UK.
- Kanis, E., Groen, A.F., De Greef, K.H., 2003. Societal concerns about pork and pork production and their relationships to the production system. *Journal of agricultural and environmental ethics*, 16, 137-162.
- Kendall, H.A., Lobao, L.M., Sharp, J.S., 2006. Public concern with animal well-being: Place, social structural location, and individual experience. *Rural Sociology*, 71(3), 399-428.
- Kjærnes, U., Lavik, R., 2007. Farm animal welfare and food consumption practices: Results from surveys in seven countries. In: Kjærnes, U., Miele, M., Roex, J. (Eds), *Attitudes of Consumers, Retailers and Producers to Farm Animal Welfare*. Cardiff University, Wales, UK, 1- 29.
- Klostermann, J.E.M., Cramer, J., 2007. Social construction of sustainability in water companies in the Dutch coastal zone. *Journal of Cleaner Production*, 15(16), 1573-1584
- Krogh, E., 1995. *Landskapets fenomenologi*. PhD-thesis. Agricultural university of Norway, Ås, Norway.
- Krogh, E., Clementsen, M., 2004. Cultural-landscaping - creating a desired identity? *XI World Congress of Rural Sociology*, Trondheim, Norway.
- Kuik, O., Verbruggen, H., 1991. *In search of indicators of sustainable development*. Kluwer, Dordrecht, the Netherlands.
- Lassen, J., Sandoe, P., Forkman, B., 2006. Happy pigs are dirty! - conflicting perspectives on animal welfare. *Livestock Science*, 103, 221-230.
- LEI, 2007. *Farm Accountancy Data Network*. Agricultural Economics Research Institute, Den Haag, the Netherlands. <http://www.lei.wur.nl/UK/statistics/Binternet/>.
- Liverman, D.M., Hanson, M.E., Brown, B.J., Merideth Jr, R.W., 1988. Global sustainability: Toward measurement. *Environmental Management*, 12, 133-143.
- Macnaghten, P., 2004. Animals in their nature: A case study on public attitudes to animals, genetic modification and 'nature'. *Sociology*, 38, 533-551.
- Macnaghten, P., 2006. Nature. *Theory, Culture and Society*, 23, 347-349.
- Macnaghten, P., Urry, J., 1998. *Contested Natures*. Sage, London, UK.
- Macnaghten, P., M. Jacobs, 1997. Public identification with sustainable development: Investigating cultural barriers to participation. *Global Environmental Change*, 7(1), 5-24.
- María, G.A., 2006. Public perceptions of farm animal welfare in Spain. *Livestock Science*, 103, 250-256.
- Marsden, T., 1990. Towards the political economy of pluriactivity. *Journal of Rural Studies*, 6(4), 375-382.
- Marsden, T.K., Whatmore, S.J., Munton, R.J.C., 1987. Uneven development and the restructuring process in British agriculture: A preliminary exploration. *Journal of Rural Studies*, 3(4), 297-308.
- McGlone, J.J., 2001. Farm animal welfare in the context of other society issues: Toward sustainable systems. *Livestock Production Science*, 72, 75-81.
- McKenzie, S., 2004. *Social sustainability: Towards some definitions*. Hawke Research Institute, University of South Australia, Magill, South Australia.
- Merleau-Ponty, M., 1970. *Phenomenology of Perception*, London, UK.
- Milbourne, P., 2003. Nature-society-rurality: Making critical connections. *Sociologia Ruralis*, 43, 193-195.
- Mollenhorst, H., 2005. *How to house a hen: assessing sustainable development of egg production systems*. PhD-thesis, Wageningen University, Wageningen, the Netherlands.
- Mollenhorst, H., Berentsen, P.B.M., De Boer, I.J.M., 2006. On-farm quantification of sustainability indicators: An application to egg production systems. *British Poultry Science*, 47, 405-417.
- Morris, C., Evans, N., 2004. Agricultural turns, geographical turns: Retrospect and prospect. *Journal of Rural Studies*, 20, 95-111.
- Morris, C., Evans, N.J., 1999. Research on the geography of agricultural change: Redundant or revitalized? *Area*, 31, 349-358.
- Motivaction, 2002. *Mentality Sociographics in marketing*. Motivaction, Amsterdam, the Netherlands.
- Mulder, S., 2003. *WIN-model: values in the Netherlands. In-depth segmentation for marketing policy*. TSN NIPO Consult, Amsterdam, the Netherlands.
- Murdoch, J., Miele, M., 1999. 'Back to nature': Changing 'worlds of production' in the food sector. *Sociologia Ruralis*, 39, 465-483.
- Nygaard, B., Storstad, O., 1998. De-globalization of food markets? Consumer perceptions of safe food: The case of Norway. *Sociologia Ruralis*, 38(1), 35-53.
- Oppenhuisen, J., 2000. *Een schaap in de bus? Een onderzoek naar waarden van de Nederlander*. PhD-thesis. University of Amsterdam, Amsterdam, the Netherlands.

References

- Oudshoorn, F.W., Renes, R.J., De Boer, I.J.M., 2008. Systems in organic dairy production. *Journal of Agricultural and Environmental Ethics*, 21, 205-228.
- Payraudeau, S., Van Der Werf, H.M.G., 2005. Environmental impact assessment for a farming region: A review of methods. *Agriculture, Ecosystems and Environment*, 107, 1-19.
- Philo, C., 2000. More words, more worlds: Reflections on the 'cultural turn' and human geography. In: Cook, I., Crouch, D., Naylor, S., Ryan, R. (Eds.), *Cultural turns/geographical turns: Perspectives on cultural geography*. Prentice Hall, Harlow, UK.
- Redclift, M., Woodgate, G., 1997. Sustainability and social construction. In: Redclift, M., Woodgate, G.(Eds.), *The international handbook of environmental sociology*. Edward Elgar, Cheltenham, UK.
- Reijnders, L., Huijbregts, M.A.J., 2005. Life cycle emissions of greenhouse gases associated with burning animal wastes in countries of the European Union. *Journal of Cleaner Production*, 13, 51-56.
- Rein, M., Schön, D.A., 1986. Frame-reflective policy discourse. *Beleidsanalyse*, 4, 4-18.
- Rigby, D., Woodhouse, P., Young, T., Burton, M., 2001. Constructing a farm level indicator of sustainable agricultural practice. *Ecological Economics*, 39, 463-478.
- Roe, E.M., 1996. Sustainable development and cultural theory. *International journal of sustainable development and world ecology*, 3, 1-14.
- Rokeach, M., 1973. *Nature of Human Values*. Free press, New York, US.
- Rose, G., 2007. *Visual Methodologies: An introduction to the interpretation of visual materials*. Sage, London, UK.
- Rosenberg, M.J., Hovland, C.I., MacGuire, W.J., 1960. *Attitude organization and change: an analysis of consistency among attitude components*. Yale University Press, New Haven, Cambridge, UK.
- Russell, D., 1995. *Theory and practice in sustainability and sustainable development*. Research and Reference Services Project, U.S. Agency for International Development Center for Development Information and Evaluation, Washington, US.
- Rye, J.F., 2006. Rural youths' images of the rural. *Journal of Rural Studies*, 22(4), 409-421.
- SAS Institute Inc., 1999. *SAS OnlineDoc Version Eight*. SAS Institute Inc., NC, US.
- Schwartz, S.H., 1999. A theory of cultural values and some implications for work. *Applied Psychology*, 48, 23-47.
- Schwartz, S.H., 2006. A theory of cultural value orientations: Explication and applications. *Comparative Sociology*, 5, 137-182.
- Schwartz, S.H., Bilsky, W., 1987. Toward A Universal Psychological Structure of Human Values. *Journal of Personality and Social Psychology*, 53, 550-562.
- Schwartz, S.H., Bilsky, W., 1990. Toward a Theory of the Universal Content and Structure of Values: Extensions and Cross-cultural Replications. *Journal of Personality and Social Psychology*, 58, 878-891.
- Schwartz, S.H., Boehnke, K., 2004. Evaluating the structure of human values with confirmatory factor analysis. *Journal of Research in Personality*, 38, 230-255.
- Scott, J., 2006. *Sociology: The key concepts*. Routledge, London, UK.
- SER, 2008. *Waarden van de Landbouw*. Sociaal Economische Raad, Den Haag, the Netherlands.
- Serpell, J.A., 2004. Factors influencing human attitudes to animals and their welfare. *Animal Welfare*, 13 (suppl) S145- S151.
- Sharp, J.S., Tucker, M., 2005. Awareness and concern about large-scale livestock and poultry: Results from a statewide survey of Ohioans. *Rural Sociology*, 70, 208-228.
- Shearman, R., 1990. The meaning and ethics of sustainability. *Environmental Management*, 14, 1-8.
- Short, B., 2006. Idyllic ruralities. In: Cloke, P.J., Marsden, T. (Eds.), *Handbook of Rural Studies*. Sage, London, UK.
- Short, J.R., 1991. *Imagined Country: environment, culture and society*. Routledge, London, UK.
- Shreck, A., Getz, C., Feenstra, G., 2006. Social sustainability, farm labor, and organic agriculture: Findings from an exploratory analysis. *Agriculture and Human Values*, 23, 439-449.
- Sismondo, 1993. Some social constructions. *Social Studies of Science*, 23, 515-553.
- SSB, 2008. *Statbank 2006*. Statistic Sentralbyrå, Statistics Norway, <http://www.ssb.no>.
- SSB, 2007. *Statbank 2005*. Statistic Sentralbyrå, Statistics Norway, <http://www.ssb.no>.
- Storstad, O., Bjørkhaug, H., 2003. Foundations of production and consumption of organic food in Norway: Common attitudes among farmers and consumers? *Agriculture and Human Values*, 20(2), 151-163.
- Sumner, J., 2005. Value wars in the new periphery: Sustainability, rural communities and agriculture. *Agriculture and Human Values*, 22, 303-312.

-
- Te Velde, H., Aarts, N., Van Woerkum, C., 2002. Dealing with ambivalence: Farmers' and consumers' perceptions of animal welfare in livestock breeding. *Journal of Agricultural and Environmental Ethics*, 15, 203-219.
- Termeer, C.A.M., Koppenjan, J.F.M., 1997. Managing Perceptions in Networks. In: Kickert, W.J.M., Klijn, E.H., Koppenjan, J.F.M. (Eds.), *Managing complex networks: strategies for the public sector*. Sage, London, UK.
- Thomas, K., 1983. *Man and the natural world : Changing attitudes in England 1500 – 1800*. Lane, London, UK.
- Thomassen, M.A., 2008. *Environmental impact of dairy cattle production systems: an integral assessment*. PhD-thesis, Wageningen University, Wageningen, the Netherlands.
- Thompson, P.B., 1986. The social goals of agriculture. *Agriculture and Human Values*, 3, 32-42.
- Thompson, P.B., 1992. The varieties of sustainability. *Agriculture and Human Values*, 9, 11-19.
- Thompson, P.B., 2006. *Ethical Bases of Sustainability*. Conference paper: European Association for Animal Production, Antalya, Turkey.
- Thompson, P.B., Nardone, A., 1999. Sustainable livestock production: Methodological and ethical challenges. *Livestock Production Science*, 61, 111.
- Tovey, H., 2000. Milk and modernity: Dairying in contemporary Ireland. *Research in Rural Sociology*, 8, 47-73.
- Tovey, H., 2003. Theorising nature and society in sociology: The invisibility of animals. *Sociologia Ruralis*, 43, 196-215.
- Trendbox, 2004. *Life & Living 2004. Trendbox kent de Nederlander door en door*. Trendbox, Amsterdam, the Netherlands.
- Tuan, Y.F., 1974. *Topophilia: A study of environmental perception, attitudes, and values*. Prentice Hall, Englewood Cliffs, US.
- Van Calker, K.J., Berentsen, P.B.M., Giesen, G.W.J., Huirne, R.B.M., 2005. Identifying and ranking attributes that determine sustainability in Dutch dairy farming. *Agriculture and Human Values*, 22, 53-63.
- Van Calker, K.J., 2005. *Sustainability of Dutch dairy farming systems: a modelling approach*. PhD-thesis, Wageningen University, Wageningen, the Netherlands.
- Van Cauwenbergh, N., Biala, K., Biolders, C., Brouckaert, V., Franchois, L., Garcia Ciudad, V., Hermy, M., Mathijs, E., Muys, B., Reijnders, J., Sauvenier, X., Valckx, J., Vanclooster, M., Van der Veken, B., Wauters, E., Peeters, A., 2007. SAFE-A hierarchical framework for assessing the sustainability of agricultural systems. *Agriculture, Ecosystems and Environment*, 120, 229-242.
- Van Dam, F., Heins, S., Elbersen, B.S., 2002. Lay discourses of the rural and stated and revealed preferences for rural living. Some evidence of the existence of a rural idyll in the Netherlands. *Journal of Rural Studies*, 18, 461-476.
- Van den Berg, A.E., Koole, S.L., 2006. New wilderness in the Netherlands: An investigation of visual preferences for nature development landscapes. *Landscape and Urban Planning*, 78, 362-372.
- Van der Ploeg, J.D., Renting, H., Brunori, G., Knickel, K., Mannion, J., Marsden, T., De Roest, K., Sevilla-Guzmán, E., Ventura, F., 2000. Rural development: From practices and policies towards theory. *Sociologia Ruralis*, 40(4).
- Van der Ziel, T., Steenbekkers, A., 2006. *Leven zonder drukte: Wat stedelingen waarderen in het platteland*. Sociaal en Cultureel Planbureau, Den Haag, the Netherlands.
- Van Eijk, A.M. (1998) *Farming systems research and spirituality: An analysis of the foundations of professionalism in developing sustainable farming systems*. PhD-thesis, Wageningen University, Wageningen, the Netherlands.
- Van Koppen, C.S.A., 2000. Resource, arcadia, lifeworld. Nature concepts in environmental sociology. *Sociologia Ruralis*, 40, 300-318.
- Van Koppen, C.S.A., 2002. *Echte natuur: Een sociaaltheoretisch onderzoek naar natuurwaardering en natuurbescherming in de moderne samenleving*. PhD-thesis, Wageningen University, Wageningen.
- Vejjola, S., Jokinen, E., 1994. The body in tourism. *Theory, Culture and Society*, 11, 125-151.
- Vereijken, P.H., 2002. Transition to multifunctional land use and agriculture. *Wageningen Journal of Life Sciences*, 50, 171-179.
- Verhoog, H., Lammerts van Bueren, E.T., Matze, M., Baars, T., 2007. The value of 'naturalness' in organic agriculture. *Wageningen Journal of Life Sciences*, 54, 333-345.
- Verhue, D., Verzijden, D., 2003. *Burgeroordelen over de veehouderij. Uitkomsten publieksonderzoek*. Bureau Veldkamp, Amsterdam, the Netherlands.

References

- Vietor, D.M., Cralle, H.T., 1992. Value-laden knowledge and holistic thinking in agricultural research. *Agriculture and Human Values*, 9, 44-57.
- Vihinen, H., 2001. *Recognising choice. A study of the changing politics of the common agricultural policy through an analysis of the MacSharry reform debate in Ireland and the Netherlands*. PhD-thesis, University of Helsinki, Helsinki, Finland.
- Vinken, H., Soeters, J., 2004. *Comparing cultures: dimensions of culture in a comparative perspective*. Brill, Leiden, the Netherlands.
- Von Wirén-Lehr, S., 2001. Sustainability in agriculture - An evaluation of principal goal-oriented concepts to close the gap between theory and practice. *Agriculture, Ecosystems and Environment*, 84, 115-129.
- VROM, 2008a. *Dossier Stankoverlast*. Dutch Ministry of Housing, Spatial Planning and the Environment. <http://www.vrom.nl> (December 2008).
- VROM, 2008b. *Dossier Verrommeling*. Dutch Ministry of Housing, Spatial Planning and the Environment. <http://www.vrom.nl> (December 2008).
- Weatherell, C., Tregear, A., Allinson, J., 2003. In search of the concerned consumer: UK public perceptions of food, farming and buying local. *Journal of Rural Studies*, 19, 233-244.
- Weber, G.M., Hoban, T.J., Kendall, P.A., Bull, L.S., 1995. Consumer concerns about modern technology in agriculture: Considerations for undergraduate and graduate teaching. *Journal of Animal Science*, 73, 2727-2732.
- Webster, J., 1995. *Animal Welfare: A cool eye towards Eden: A constructive approach to the problem of man's dominion over the animals*. Blackwell Science, Oxford, UK.
- Wilkie, R., 2005. Sentient commodities and productive paradoxes: The ambiguous nature of human-livestock relations in Northeast Scotland. *Journal of Rural Studies*, 21, 213-230.
- WRR, 2007. *Identificatie met Nederland*. Wetenschappelijke Raad voor Regeringsbeleid, Amsterdam University Press, Amsterdam, the Netherlands.
- Yarwood, R., Evans, N., 1998. New places for "old spots": The changing geographies of domestic livestock animals. *Society and Animals*, 6, 137-165.
- Yarwood, R., Evans, N., 2000. Taking stock of farm animals and rurality. In: Philo, C., Wilbert, C. (Eds.), *Animals Spaces, Beastly Places*. Routledge, London, UK.
- Zinck, J.A., Berroterán, J.L., Farshad, A., Moameni, A., Wokabi, S., Van Ranst, E., 2004. Approaches to assessing sustainable agriculture. *Journal of Sustainable Agriculture*, 23, 87-109.

Summary

Introduction

Over the past fifty years the scale of animal farming has increased and livestock farming has intensified. At the same time, Western societies has become more urbanized and fewer people have close family members involved in farming. As a result most citizens have little knowledge or direct experience of what farming entails. These developments are leading to changes in public attitudes towards animal farming in Western society, with more people expressing concern over issues such as farm animal welfare. This has led to more public demand for more sustainable ways of animal farming.

Sustainable development is a contested concept and has been defined in numerous ways, which have been widely debated and discussed. A central concept of sustainability is that 'future generations should not be harmed'. Many studies refer to three pillars of sustainability; the economic, the environmental and the social. To date, little research has been carried out on the social pillar of sustainable animal farming. The **aim** of this thesis is therefore to gain insights into the **socio-cultural sustainable development** of animal farming systems. Socio-cultural sustainable development is defined by public perceptions: which include the concerns about, and underlying meanings of, animal farming held by the general public. These are socially constructed and stem from specific socio-cultural contexts. This thesis focuses on **social perceptions of animal farming**, to gain insights in the socio-cultural aspects of sustainable animal farming.

Research questions

This thesis starts by identifying aspects of dairy farming systems which are of concern to the general public – i.e. socio-cultural issues. It explains the background of these issues, the underlying collective meanings of animal farming. It also seeks to understand the factors that influence people's (individual) perceptions of animal farming. People's perceptions of animal farming depend on their frame of reference. This study focuses on four factors (which together form a frame of reference) which could influence perceptions of animal farming; values, convictions, knowledge and experiences. In summary, the thesis addresses the following three research questions:

- 1) What aspects of present day animal farming systems are citizens concerned about?
- 2) What collective meanings are attached to animal farming?
- 3) What factors influence people's perceptions of animal farming?

Methodology: a two-pronged approach

The study focuses on social attitudes in the Netherlands and Norway towards dairy farming. The Netherlands is very densely populated, agriculture and the countryside are under considerable pressure and the boundaries between urban and rural areas are becoming less clear. Norway was chosen as the comparison country, as it is less urbanized, has a lower population density and less intensive agriculture than the Netherlands. The study focused on dairy farming because it is less intensive compared to other livestock sectors (such as pig or poultry farming) and people are likely to have fewer prejudices or fixed concerns towards dairy farming. The thesis seeks to explore people's attitudes towards a range of issues and it was expected that dairy farming would give more opportunity of exploring different issues, whereas in more intensive farming systems people would be more likely to focus solely on the issue of animal welfare. In addition many people associate animal farming with grazing cows and dairy farming is embedded in the landscape, as it accounts for a high proportion of land use. This embeddedness in the rural landscape was also seen as likely to influence people's perceptions of animal farming.

To address the research questions, the thesis followed two avenues: a qualitative one (the first avenue) and a quantitative one (the second avenue). The **first avenue** involved setting up dairy farm visits by citizen panels and explored what people perceived and how they reacted to these perceptions. This exercise provided insights to research questions one and two. The farm visits were intended to show people what farming actually entails, so they could address the issues on the basis of a real life experience with the material aspects of farming. A real life experience stimulates all the senses simultaneously. During the visits people were asked about their sensory experiences - smell, hearing, sight and feeling - and handed out a digital camera so they could record aspects of the dairy farm that they thought were valuable. Sensory perceptions provided an appropriate way to draw out spontaneously expressed reactions about animal farming systems. The visits took place in three regions of the Netherlands (Friesland, Zuid-Holland and Noord-Brabant) and one in Norway (Vestfold). Time and financial restrictions meant it was not possible to include more regions in Norway.

The **second avenue** sought to discover the factors that influence people's perceptions of animal farming. This was done by way of two surveys in the Netherlands: one about animal welfare and one about dairy farming in general. The former was based on an existing dataset of people's perceptions of animal welfare, collected by the Rathenau Institute, and the latter survey was designed on the basis of the qualitative Dutch findings from this research. People's frames of reference were used as the basis for discovering explanatory factors. A frame of reference can be described as the whole set of values, norms, convictions, knowledge and experiences which provide the basis on which a person perceives,

judges and acts. Factual knowledge and direct experiences refer to the amount and quality of factual knowledge that people have of (animal) farming and their experiences with it. Convictions are firmly held beliefs or opinions and values are the core of culture. Values function as 'criteria' or standards on which evaluations are made. Moreover, they are relatively 'stable' and are neither 'right' or 'wrong' but set personal preferences. In addition, values are implicit, and therefore difficult to measure. Value-orientations are frequently used to gain insights into people's values. A value-orientation is a set of the most important values held by a group of people. This thesis made use of the Dutch WIN-model (Waardenoriëntaties in Nederland, Value-orientations in the Netherlands), which discerns eight value-orientations in Dutch society: socially minded, caring and faithful, conservative, hedonist, materialist, professional, broad-minded and balanced.

Conclusions

In addressing the **first research question** a list of the valuable aspects of the farms identified by the Dutch respondents was drawn up (chapter five). This list was divided into a number of '**socio-cultural issues**', that reflect concerns about different themes including: the way food is produced, the living environment and handling of farm animals, the preservation of the rural landscape, services for society and the preservation of farming culture and national identity. The variety of issues identified as important by the panel members shows that people are concerned about many aspects of dairy farming, rather than purely focused on animal welfare.

Sustainability issues are context-dependent and culturally defined. In order to better understand the context-dependency, this thesis compares how these issues were perceived and constructed in the two countries. The motivations and explanations of Dutch and Norwegian respondents were explored to gain insights into the underlying **collective meanings** of animal farming (**second research question**, chapter six). These collective meanings of animal farming are based on general ideas about what is considered characteristic of animal farming and what are considered to be good and bad practices. This set of collective meanings of animal farming describes animal farming as a **social construction**. The social construction of animal farming consists of social images and expectations of animal farming that are based on general ideas about how animal farming looks, how it should look and why it should look like that.

The social construction of animal farming can be seen as having two layers. The first layer concerned the **four general themes** which people noticed at the farm: animals and their products, farming practices, the rural landscape and the farmer. The second layer describes the underlying meanings

attached to those aspects and to animal farming as a whole. It gives insights in how people evaluate what they see and which collective evaluative or normative schemes for animal farming they use as reference point. When panel members explained why they appreciated specific aspects of a farm, they used arguments that related to **three angles of vision**: modernity, traditions and 'naturalness'. Modernity in farming refers to a continuing process of rationalization, searching for the most productive and efficient farming systems by making use of high levels of technology. Tradition refers to customary ways of doing things, such as the involvement of family members in the farm. 'Naturalness' in farming refers to interactions with nature (including animals). People experienced dilemmas between these three angles of vision and their wishes were sometimes contradictory, as they were trying to reconcile the three; they wanted farms to be simultaneously modern, traditional and natural. The three angles of vision cover the perspectives from which people look at dairy farming and also shape the tensions in people's appreciation. These tensions took different forms between the four themes, with people perceiving different concerns and dilemmas for each theme.

In addition, people's appreciation of the angles of vision varied. People perceived the angle of vision positively or negatively, according to the theme being addressed. As such, each angle of vision appeared to have **two faces**. The positive face of modernity is seen in the successful process of agricultural modernization through pursuing the values of progression, efficiency and prosperity. Whereas its negative face can be described as a threat to natural and traditional values, reflected in issues such as the loss of nature, depletion of resources, pollution of the environment, negative effects on animal welfare, loss of culture and a decrease in the diversity of landscapes and food products. The positive aspects of tradition in animal farming are romantic, idyllic, nostalgic, and refer to a situation where humans and animals live in harmony. But, on the negative side it can be dull, backward, old-fashioned and static. Naturalness also has two faces; one represents wilderness, which needs to be conquered and dominated. Agriculture is a clear example of humans' success in dominating and cultivating nature for human progress. But naturalness also represents the benign and Arcadian aspects of wilderness, which should be free from human intervention and damage.

These faces and dilemmas **differ** (in some respects) between the two countries. The most striking difference between Norway and the Netherlands was the different conceptualization of 'nature': Norwegian respondents perceived the rural area as a transition area between natural and urban areas, while Dutch respondents experienced the rural area as part of the 'green area' and nature. Consequently, Norwegian respondents perceived farm animals as part of the 'intermediate' areas, whereas Dutch respondents considered farm animals as part of nature. As such, Norwegians perceived

a dilemma between farm specialization and the preservation of diversity and variety in farm production (a modernity-tradition dilemma with regard to farm animals), whereas Dutch citizens were more concerned about the tensions between modernity and farm animals' naturality.

This analysis showed a number of tensions in people's views about animal farming and showed that collective meanings of animal farming are characterized by multiple ambivalences – and are polyvalent. As such, people's ideas about animal farming are not so black and white as sometimes is suggested: Respondents did not condemn modern animal farming and long merely for a rural idyll. Instead, people simultaneously appreciated different aspects of modernity, traditions and naturality and were aware of the tensions and dilemmas between these three angles of vision. People considered farmers to be at the centre of all of the dilemmas they perceived and expected them to manage these dilemmas, resolve the conflicts and maintain the desired balance between modernity, tradition and naturality. People were also aware that their wishes were difficult to put into practice and were willing to consider compromises.

The two quantitative surveys revealed the **factors that influence** people's perceptions of animal farming (**research question three**, chapters four and seven). The findings showed that people with **more experience** with farming found it more acceptable to trade off animals' naturality against modernity. In addition, people with a connection to agriculture were more positive about farmers' image and the quality of life of farm animals. Providing people with more information (in the form of a leaflet) about animal farming had a very limited effect and a large majority of respondents was not interested in receiving information about animal farming, which suggests that this method of increasing people's knowledge about animal farming would not be very effective.

The findings showed that people's **value-orientation** influences their opinion about animal farming. The findings also revealed that value-orientations indicate the direction in which people search for compromises. In general progressive people believe that technological solutions can improve the quality of life of farm animals, whereas conservative people preferred a more traditional and natural farm. The latter group is less attracted to modernity and is less likely to be convinced by solutions that rely upon technological innovations.

Convictions also played a role in people's perceptions of animal farming. People who believed in harmonious human-nature relationships and in egalitarian human-animal relationships preferred more traditional and natural dairy farms and were less accepting of modernity in farm practices and the treatment of farm animals than people who believed that humans are superior to animals or nature.

The **main aim** of this thesis is to gain insights into **socio-cultural sustainable development** of animal farming systems – the ‘S’ of the EES concept. The socio-cultural sustainable development of animal farming systems is defined by public perceptions of animal farming and includes concerns and underlying meanings about animal farming, which stem from specific socio-cultural contexts. The present study showed that the public considers that animal farming should entail aspects of tradition and naturality, as well as modernity. As such, the socio-cultural sustainable development of animal farming combines ‘the best’ of these three worlds. What people consider as ‘the best’ modern developments, farming traditions or aspects of nature are culturally defined and context-dependent – these evaluations reflect the underlying collective meanings attached to animal farming. Hence, the definition of ‘the best’ can differ between countries. In the Netherlands, it refers for example to grazing cows and to automatic feeding devices. In addition, the study also found that different groups of people have different perceptions of animal farming. People’s values, convictions, knowledge and experiences lead them to be more appreciative of more modern, more traditional or more natural farms. Consequently, the socio-cultural sustainable development of animal farming differs not only between countries but also between groups of people within the same country.

One can say also that ‘the best’ economic and environmental aspects of animal farming are also culturally defined and context dependent in the sense that sustainable development itself is socially and culturally constructed. As such, socio-cultural sustainability stretches beyond the ‘S’ of the EES-concept and the implications of this are expounded in the following discussion.

Discussion

The general discussion of this thesis has focused on the implications for the social acceptance of animal farming systems and on the implications for research into sustainable development (particularly of animal farming systems).

In general, one can discern two ways of making animal farming systems (more) **socially acceptable**: either adjust the opinion of the public or adjust and re-design the livestock farming system. Although the distinction appears quite simplistic it is helpful to look at the problem from these two sides.

Although ‘**informing the general public**’ is often put forward as the solution to make animal farming systems more socially acceptable, this is not as simple and self-evident as it may seem. The quantitative parts of this study did show that people with more knowledge about and/or experiences with farming had more positive perceptions of animal farming and were more accepting of modernity towards

farm animals. Despite this the effect of information supply might be limited. First of all, because a large majority of Dutch respondents was not interested in receiving information about animal farming and second, because value-orientations played an important role in people's perception and values are relatively stable and difficult to change. One could question the intended purpose of information supply. If the purpose of information supply is to *positively* influence people's opinion about animal farming - based on the idea that the public has negative 'misconceptions' about animal farming - this can easily smack of propaganda or manipulation. Moreover, supplying information might also have adverse effects on people's perceptions; it might lead them to become more concerned or have a less positive perception of animal farming.

This thesis also raises questions about designing **animal farming systems** on the basis of citizens' wishes and concerns. First, on a practical level it requires a conversion to apply the theoretical findings (of this thesis) to actual system innovations, for example, to translate modernity, tradition and naturality into practical solutions at farm level. Second, this thesis showed that citizens' wishes can differ from their level of acceptance. Thus in an ideal situation people may wish for a traditional and natural way of animal farming, which suggests that they reject modern developments. Yet, in reality people make trade-offs between different aspects of animal farming as they are aware that their wishes are difficult to realize. To design farming systems around social preferences, one can ask the public to rank the different aspects and issues and derive a list of priority issues. However, this thesis showed that different groups of people have different preferences. Consequently different groups of people might set different priorities and make different trade-offs, resulting in different lists of priorities. For future studies and system innovations it would be interesting to take a closer look at different groups of people and the different priorities they set.

This thesis also has a number of implications for **sustainable development**, with regard to the way one *approaches* sustainable development and also for the way one *studies* sustainable development.

To start with the way one *approaches* sustainable development: this thesis followed a constructivist approach by looking at the collective meanings that underlie sustainability issues. Collective meanings are general ideas about what is characteristic for animal farming and give rise to notions of what is good and bad. One can extend this constructivist line of thought to the concept of sustainable development itself. Sustainability (of animal farming, but also of other phenomena) as a social construction is, under this understanding, a set of collective meanings about what is considered sustainable and what is considered unsustainable. This constructivist line of thought first of all implies the acknowledgement of

multiple meanings of sustainable development, which are context-dependent. This study focused on dairy farming in the Netherlands and Norway and future research may find it interesting to look at other contexts – e.g. Southern Europe, the United States or non-Western cultures – and other farming systems – e.g. pigs or poultry. In addition, the constructivist approach also implies acknowledging that sustainable development is a **value-loaded concept**, which requires an ongoing debate about what is considered sustainable and what is not, since human values and needs shift over time. Collective meanings of sustainable development may include **unsustainable** as well as **sustainable** aspects. Whereas many sustainability studies focus on what they consider to be unsustainable in order to improve sustainability, one should be aware not to lose valuable aspects (i.e. positive aspects, non-concerns) that are not part of these sustainability criteria.

This thesis contains three implications for the way one *studies* the sustainable development of animal farming systems. Most importantly, one limitation of the constructivist approach is that it often only focuses on the meaning of phenomena and thereby tends to ignore the material world. Consequently, one should not only study the **meaning** of sustainable development, but also what is to be sustained – the **material** aspect. This requires an interdisciplinary approach to gain a better understanding of the interaction between the meaning and material elements. Such **interdisciplinary** studies need to combine expertise from the social sciences – about the meaning – with knowledge from the natural sciences – about the material. Thirdly, the constructivist approach opens up possibilities to develop **new research methods** to study the sustainability of animal farming. This thesis studied the socio-cultural sustainability of animal farming by looking at people's on-farm sensory perceptions. This real life experience gathered from farm visits appeared a fruitful way to gain insight in people's perceptions and underlying collective meanings. However, some issues, such as global and environmental ones are not revealed by direct perceptions and future research might benefit from seeking to include such issues in another way. The methodology employed in this study could be extended beyond the farm level, by for example making a 'tour' through a region, which would extend the experience from the farm yard to regional level. A final analytical aspect of this study that could be further developed would be to look at people's sensory perceptions in more detail. In this thesis people's sensory perceptions were analysed together, whereas other studies show that each sense can connect to different meanings.

Samenvatting

Sociaal-culturele Duurzaamheid van de Veehouderij

Een onderzoek naar burgerpercepties van de melkveehouderij in Nederland en Noorwegen

Introductie

De afgelopen 50 jaar is de veehouderij in schaalgrootte toegenomen en geïntensiveerd. Tegelijkertijd zijn Westerse samenlevingen meer verstedelijkt en hebben minder mensen familieleden in de landbouw. Als gevolg daarvan hebben weinig burgers kennis van of directe ervaring met de landbouw. Deze ontwikkelingen leiden onder andere tot veranderingen in maatschappelijke houdingen t.o.v. landbouwhuisdieren in Westerse samenlevingen. Steeds meer mensen spreken hun zorgen uit over kwesties zoals dierenwelzijn. Dit heeft geleid tot een algemene vraag naar duurzamere manieren van dierlijke productie.

Duurzame ontwikkeling is een omstreden concept en wordt in veel gebieden bediscussieerd en op verschillende manieren gedefinieerd. Een centraal concept van duurzaamheid is dat 'toekomstige generaties geen schade berokkend wordt'. Veel studies refereren naar de drie pilaren van duurzaamheid: economie, milieu en maatschappij (z.g. EES-concept). Tot nu toe is nog weinig onderzoek uitgevoerd naar de maatschappelijke pilaar van een duurzame veehouderij. Het doel van deze thesis is daarom inzicht te verkrijgen in sociaal-culturele duurzaamheid van veehouderijsystemen. Sociaal-culturele duurzaamheid wordt bepaald door burgerpercepties: dit betreft de zorgen om, en onderliggende betekenissen van, de veehouderij in de ogen van de maatschappij. Deze zijn sociaal geconstrueerd en komen voort uit een specifieke sociaal-culturele context. De thesis richt zich dus op burgerpercepties van de veehouderij om inzicht te krijgen in de sociaal-culturele aspecten van een duurzame veehouderij.

Onderzoeksvragen

De thesis begint met het identificeren van aspecten van melkveehouderijsystemen die reden zijn tot zorg in de ogen van de maatschappij – z.g. sociaal-culturele issues. Het verklaart tevens de achtergrond van deze issues; de onderliggende collectieve betekenissen van veehouderij. Het tracht ook de factoren te begrijpen die (individuele) percepties over de veehouderij beïnvloeden. De studie

richt zich op vier factoren die percepties over de veehouderij kunnen beïnvloeden (welke gezamenlijk het referentiekader vormen); waarden, overtuigingen, kennis en ervaringen. Samenvattend beantwoordt de thesis de volgende onderzoeksvragen:

- 1) Over welke aspecten van huidige veehouderijsystemen zijn burgers bezorgd?
- 2) Welke collectieve betekenissen zijn aan de veehouderij verbonden?
- 3) Welke factoren beïnvloeden percepties over de veehouderij?

Methodiek: een twee-weg benadering

De studie richt zich op burgerpercepties van de melkveehouderij in Nederland en Noorwegen. Nederland is zeer dichtbevolkt, landbouw en het platteland staan onder aanzienlijke druk en grenzen tussen de stedelijke en rurale gebieden worden steeds vager. Noorwegen was gekozen als vergelijkend land, aangezien het minder verstedelijkt is, een lagere bevolkingsdichtheid heeft en de landbouw minder geïntensiveerd is dan in Nederland. De studie richtte zich op de melkveehouderij omdat deze minder intensief is vergeleken met andere veehouderij sectoren (zoals varkens of pluimvee) en mensen daarom hoogstwaarschijnlijk minder vooroordelen of vaste zorgen hebben richting de melkveehouderij. De thesis trachtte verschillende issues in burgerpercepties te verkennen, en er werd verwacht dat de melkveehouderij de mogelijkheid bood om verschillende issues te verkennen, terwijl bij meer intensieve veehouderijsystemen waarschijnlijk alleen het issue dierenwelzijn de aandacht trekt. Daarbij komt dat veel mensen de veehouderij associëren met grazende koeien en dat de melkveehouderij grondgebonden is, waardoor het is ingebed in het landschap en een groot deel van het landgebruik beslaat.

De thesis volgde twee lijnen om de onderzoeksvragen te beantwoorden: een kwalitatieve (de eerste) en een kwantitatieve lijn (de tweede). De **eerste lijn** bestond uit het bezoeken van melkveehouderij-bedrijven met burgerpanels en verkende wat mensen beleefden en hoe zij reageerden op die ervaringen. Dit veldwerk gaf inzicht in de onderzoeksvragen één en twee. Het doel van de bedrijfsbezoeken was mensen te laten zien hoe een veehouderijbedrijf eruit uitziet, zodat zij issues konden aandragen op basis van levensechte ervaringen met de materiële aspecten van de veehouderij. Een levensechte ervaring stimuleert alle zintuigen tegelijkertijd. Gedurende deze bedrijfsbezoeken werden de deelnemers gevraagd naar hun zintuiglijke waarnemingen – reuk, gehoor, zicht en gevoel. Iedere deelnemer ontving een digitale camera om aspecten van het melkveebedrijf die ze waardevol vonden vast te leggen. De zintuiglijke waarnemingen waren een geschikte manier om spontane reacties over de veehouderij los te krijgen. De bedrijfsbezoeken vonden plaats in drie Nederlandse provincies (Friesland, Zuid-Holland en Noord-Brabant) en één Noorse regio (Vestfold). Wegens gebrek aan tijd en financiële

middelen was het niet mogelijk het onderzoek in meer dan één Noorse regio uit te voeren.

De **tweede lijn** trachtte factoren te vinden die burgerpercepties van de veehouderij beïnvloeden. Hiervoor werden twee nationale enquêtes in Nederland uitgevoerd: een over dierenwelzijn en een over de melkveehouderij in het algemeen. De eerste was gebaseerd op een bestaande dataset over burgerpercepties m.b.t. dierenwelzijn, samengesteld door het Rathenau Instituut, en de tweede was ontworpen op basis van de kwalitatieve bevindingen van dit onderzoek. Het referentiekader vormde de basis om verklarende factoren te vinden. Een referentiekader kan worden omschreven als een set van waarden, normen, overtuigingen, kennis en ervaringen op grond waarvan mensen waarnemen, oordelen en handelen. Kennis en directe ervaringen refereren naar de hoeveelheid en kwaliteit van feitelijke kennis die mensen hebben en hun ervaringen met landbouw. Overtuigingen zijn stevig gegronde meningen en waarden vormen de kern van een cultuur. Waarden functioneren als 'criteria' of standaarden op grond waarvan men evaluaties maakt. Bovendien zijn ze relatief 'stabiel' en noch 'goed' of 'fout', maar ze impliceren een prioriteit in persoonlijke voorkeur. Daarnaast zijn waarden impliciet en daarom moeilijk te meten. Waardeoriëntaties worden vaak gebruikt om inzicht te krijgen in de waarden van mensen. Een waardeoriëntatie is een set van meest belangrijk waarden voor een groep mensen. Deze thesis maakte gebruik van het Nederlandse WIN-model (Waardeoriëntaties In Nederland), dat acht waardeoriëntaties in de Nederlandse samenleving onderscheidt: Zorgzamen, Behoudenden, Genieters, Luxezoekers, Zakelijken, Ruimdenkers, Geëngageerden en Evenwichtigen.

Conclusies

De **eerste onderzoeksvraag** resulteerde in een lijst van waardevolle aspecten van melkveebedrijven geïdentificeerd door de Nederlandse respondenten (hoofdstuk vijf). Deze lijst werd onderverdeeld in een aantal ' **sociaal-culturele issues** ', welke zorgen over verschillende thema's reflecteren zoals: de manier waarop voedsel wordt geproduceerd, de leefomgeving van en de omgang met het vee, behoud van het rurale landschap, diensten voor de samenleving en het behoud van agrarische tradities en nationale identiteit. De variatie tussen de issues – die door de panelleden als belangrijk werden beschouwd – laat zien dat burgers over meer aspecten van de melkveehouderij bezorgd zijn dan alleen dierenwelzijn.

Duurzaamheidsissues zijn contextafhankelijk en cultureel bepaald. Om de contextafhankelijkheid beter te begrijpen, vergelijkt deze thesis hoe issues worden ervaren en geconstrueerd in twee landen. De verklaringen en motivaties van de Nederlandse en Noorse respondenten werden bestudeerd om inzicht te krijgen in onderliggende **collectieve betekenissen** van de veehouderij (**de tweede onderzoeks-**

vraag, hoofdstuk zes). Deze collectieve betekenissen van de veehouderij zijn gebaseerd op algemeen geldende ideeën over wat als karakteristiek voor de veehouderij beschouwd wordt en wat als goede en slechte praktijken gezien wordt. Deze set van collectieve betekenissen van de veehouderij beschrijft de veehouderij als een **sociale constructie**. De sociale constructie van de veehouderij bestaat uit maatschappelijke beelden en verwachtingen van de veehouderij die zijn gebaseerd op algemeen geldende ideeën over hoe de veehouderij eruit ziet, hoe het eruit zou moeten zien en waarom het er zo uit zou moeten zien.

Men kan de sociale constructie van de veehouderij in twee lagen beschouwen. De eerste laag betrof de **vier algemene thema's** die mensen waarnamen op het bedrijf; de dieren en hun producten, de manier van 'boeren', het rurale landschap en de veehouder. De tweede laag beschrijft de onderliggende betekenissen van de verschillende aspecten en de veehouderij als geheel. Het geeft inzicht in hoe mensen evalueren wat ze zien en welke collectieve evaluatieve of normatieve systemen men gebruikt als referentiepunt voor de veehouderij. Wanneer panelleden uitleggen waarom zijn bepaalde aspecten van een melkveebedrijf waarderen, gebruiken ze argumenten die refereren naar **drie 'kernwaarden'**: moderniteit, traditie en natuurlijkheid. Moderniteit in de landbouw refereert naar een continu proces van rationalisatie en een zoektocht naar de meest productieve en efficiënte landbouwsystemen door gebruik te maken van geavanceerde technologieën. Traditie refereert naar gebruiken – de dingen op de gebruikelijke manier doen -, zoals het gezinsbedrijf in de landbouw. Natuurlijkheid in de veehouderij refereert naar de interactie met de natuur (inclusief de dieren). Burgers beleefden dilemma's tussen deze drie kernwaarden en hun wensen waren af en toe tegenstrijdig, aangezien ze probeerden de drie te verenigen; ze wilden bedrijven die tegelijkertijd modern, traditioneel en natuurlijk waren. De drie kernwaarden geven de perspectieven weer waarmee men naar de melkveehouderij kijkt, en geven zo ook het spanningsveld weer in de waardering van burgers. De spanningen verschillen tussen de vier thema's, d.w.z. dat burgers verschillende zorgen en dilemma's voor ieder thema hadden.

Daarnaast verschilde de waardering van de oogpunten zelf. Afhankelijk van het thema dat aangedragen werd, beschouwde men het oogpunt positief of negatief. Dit betekende dat iedere kernwaarden **twee gezichten** heeft. Het positieve gezicht van moderniteit reflecteert het succesvolle proces van modernisatie in de landbouw gebaseerd op waarden van progressie, efficiëntie en welvaart. Het negatieve gezicht daarentegen kan omschreven worden als een bedreiging voor waarden van natuur en traditie en komt tot uiting via issues zoals verlies aan natuur, uitputting van hulpbronnen, vervuiling van milieu, negatieve effecten op dierenwelzijn, verlies aan cultuur en een afname in variatie van het landschap en producten. De positieve aspecten van tradities in de veehouderij vertegenwoordigen

romantiek, idylle en nostalgie en refereren naar een situatie waar mensen en dieren in harmonie met elkaar leven. Maar aan de negatieve kant kunnen tradities saai, achtergebleven, ouderwets en statisch zijn. Ook natuurlijkheid heeft twee gezichten; het ene vertegenwoordigt wildernis die overwonnen en gedomineerd moet worden. Landbouw is een duidelijk voorbeeld van menselijk succes in het domineren en cultiveren van natuur voor menselijke vooruitgang. Maar natuurlijkheid vertegenwoordigt ook de goedaardige en Arcadische aspecten van de wildernis, welke beschermd moeten worden tegen menselijke interventie en beschadiging.

De gezichten en dilemma's **verschillen** (in bepaalde opzichten) tussen de twee landen. Het meest opvallende verschil tussen Noorwegen en Nederland was de beeldvorming van 'natuur'. De Noorse respondenten zagen het platteland als overgangsgebied tussen natuurlijke en stedelijke gebieden, terwijl de Nederlandse respondenten het platteland zagen als onderdeel van de 'groene ruimte' en natuur. Als gevolg hiervan beschouwden de Noorse respondenten landbouwhuisdieren als onderdeel van de 'intermediaire' gebieden, terwijl de Nederlandse respondenten landbouwhuisdieren als onderdeel van natuur beschouwden. Dit betekent dat Noren een dilemma ervaren tussen specialisatie en het behoud van diversiteit en variatie in productie (een dilemma tussen moderniteit en traditie m.b.t. landbouwhuisdieren), terwijl Nederlandse burgers meer bezorgd waren over de spanningen tussen moderniteit en natuurlijkheid in het houden van landbouwhuisdieren.

De analyse liet een aantal spanningsvelden zien in de perceptie van burgers over de veehouderij en liet zien dat collectieve betekenissen van de veehouderij gekenmerkt worden door meerdere ambivalenties – ze zijn polyvalent. Dit betekent dat de beelden van burgers over de landbouw niet zo zwart-wit zijn als soms verondersteld wordt: respondenten wezen moderne veehouderij noch volledig af, noch verlangden zij puur en alleen naar een rurale idylle. In plaats daarvan waardeerden burgers verschillende aspecten van moderniteit, traditie en natuurlijkheid tegelijkertijd en waren zij zich bewust van de spanningsvelden en dilemma's tussen deze drie oogpunten. Burgers zagen veehouders als middelpunt tussen alle dilemma's en verwachtten van hen dat ze dilemma's managen, conflicten oplossen en de gewenste balans houden tussen moderniteit, traditie en natuurlijkheid. Burgers waren zich er ook van bewust dat hun wensen moeilijk in de praktijk te brengen zijn en ze waren bereid tot het overwegen van compromissen.

De twee kwantitatieve enquêtes onthulden **factoren** die burgerpercepties over de veehouderij **beïnvloeden** (**derde onderzoeksvraag**, hoofdstukken vier en zeven). De resultaten lieten zien dat mensen met **meer ervaring** met de landbouw, het acceptabeler vonden om de natuurlijkheid van dieren

af te wegen tegen moderniteit. Daarnaast hadden mensen met een connectie in de landbouw een positiever beeld over veehouders en de levenskwaliteit van het vee. Het verstrekken van extra informatie aan mensen (in de vorm van een flyer) over de veehouderij had een zeer beperkt effect en bovendien was een grote meerderheid van de respondenten (85%) niet geïnteresseerd in het ontvangen van informatie over de veehouderij, wat suggereert dat deze methode om de kennis van burgers over de veehouderij te vergroten niet erg effectief zal zijn.

De resultaten lieten verder zien dat **waardeoriëntaties** de mening van mensen over de veehouderij beïnvloeden en dat waardeoriëntaties de richting aangeven waarin mensen naar compromissen zoeken. Over het algemeen zijn progressieve mensen van mening dat technologische oplossingen de levenskwaliteit van landbouwhuisdieren kan verbeteren, terwijl conservatieve mensen een sterkere voorkeur hebben voor een traditionele en natuurlijke veehouderij. Deze laatste groep voelt zich minder aangetrokken tot moderniteit en zal daarom ook minder makkelijk overtuigd worden door oplossingen die op technologische innovaties berusten.

Overtuigingen speelden ook een rol in burgerpercepties over de veehouderij. Mensen die geloofden in harmonieuze mens-natuur relaties en in gelijkwaardige mens-dier relaties hadden een sterkere voorkeur voor een traditionele en natuurlijke melkveehouderij en accepteerden minder moderniteit in de manier van 'boeren' en de omgang met landbouwhuisdieren dan mensen die geloofden dat mensen boven dieren of de natuur staan.

Het **hoofddoel** van deze thesis is om inzicht te verkrijgen in **sociaal-culturele duurzaamheid** van veehouderijsystemen – de 'S' van het EES concept. Sociaal-culturele duurzaamheid van veehouderijsystemen wordt bepaald door burgerpercepties van de veehouderij en betreft zorgen over en onderliggende betekenissen van de veehouderij, welke voortkomen uit een specifieke sociaal-culturele context. De huidige studie heeft laten zien dat burgers van mening zijn dat de veehouderij aspecten van zowel traditie als natuurlijkheid als ook moderniteit moet hebben. Als zodanig combineert sociaal-culturele duurzaamheid van de veehouderij 'het beste' van drie werelden. Wat mensen beschouwen als de 'beste' moderne ontwikkelingen, agrarische tradities of aspecten van natuur is cultureel bepaald en contextafhankelijk – deze evaluaties reflecteren de onderliggende collectieve betekenissen gekoppeld aan de veehouderij. Vandaar dat de definitie van 'het beste' kan verschillen tussen landen. In Nederland refereert het bijvoorbeeld naar grazende koeien en automatische voersystemen. Daarnaast liet deze studie zien dat percepties van de veehouderij kunnen verschillen tussen groepen mensen. Hun waarden, overtuigingen, kennis en ervaringen beïnvloedden of zij juist

modernere, traditionelere of natuurlijkere bedrijven waardeerden. Dit betekent dat sociaal-culturele duurzaamheid niet alleen tussen landen verschilt, maar ook tussen groepen mensen binnen een land.

Men zou kunnen zeggen dat ook 'de beste' economische en milieuaspecten van de veehouderij cultureel bepaald zijn en contextafhankelijk. In die zin is duurzame ontwikkeling zelf sociaal en cultureel geconstrueerd. In dit opzicht reikt sociaal-culturele duurzaamheid verder dan de 'S' van het EES concept. De implicaties hiervan worden toegelicht in de discussie hieronder.

Discussie

De algemene discussie van deze thesis (hoofdstuk acht) richtte zich op de implicaties voor maatschappelijke acceptatie van veehouderijsystemen en de implicaties voor onderzoek naar duurzame ontwikkeling (m.n. voor veehouderijsystemen).

Over het algemeen kan men op twee manieren tot (meer) **maatschappelijk geaccepteerde** veehouderijsystemen komen: het beïnvloeden en aanpassen van de publieke opinie of het aanpassen en herontwerpen van de veehouderijsystemen. Alhoewel dit onderscheid vrij simplistisch lijkt, is het bruikbaar om vanuit deze twee kanten naar het probleem te kijken.

Alhoewel '**informereren van het algemene publiek**' vaak naar voren wordt geschoven als de oplossing om de maatschappelijk acceptatie van veehouderijsystemen te verhogen, is dit niet zo eenvoudig en vanzelfsprekend als het lijkt. Het kwantitatieve gedeelte van deze studie heeft laten zien dat mensen met meer kennis over en ervaringen met de landbouw een positiever beeld hadden over de veehouderij en meer moderniteit accepteerden richting landbouwhuisdieren. Ondanks dit gegeven, zou het effect van informatieverstrekking beperkt kunnen zijn. Ten eerste omdat een grote meerderheid van de respondenten niet geïnteresseerd was in het ontvangen van informatie over de veehouderij en ten tweede omdat waardeoriëntaties een belangrijke rol speelden in de perceptie en waarden zijn relatief stabiel en moeilijk te veranderen. Men zou daarnaast het beoogde doel van informatieverstrekking ter discussie kunnen stellen. Als het doel van informatieverstrekking is om de publieke opinie *positief* te beïnvloeden – gebaseerd op het idee dat de maatschappij negatieve 'misvattingen' heeft over de veehouderij – kan dit gemakkelijk de smaak van propaganda of manipulatie met zich meebrengen. Bovendien kan informatieverstrekking ook het tegenovergestelde effect hebben op burgerpercepties; mensen kunnen juist ook bezorgder worden of minder positief over de veehouderij gaan denken.

Deze thesis roept ook vragen op ten aanzien van het **ontwerpen van veehouderijsystemen** op basis

van wensen en zorgen van burgers. Ten eerste vragen de theoretische bevindingen (van deze thesis) om een vertaalslag naar een toepasbaar niveau, waarin de bevindingen worden omgezet in daadwerkelijke systeeminnovaties. Bijvoorbeeld om moderniteit, traditie en natuurlijkheid te vertalen in praktische oplossingen op bedrijfsniveau. Ten tweede, heeft deze thesis laten zien dat de wensen van burgers kunnen verschillen van hun niveau van acceptatie. Dus in een ideale situatie kunnen mensen verlangen naar een natuurlijke en traditionele manier van veehouderij, wat suggereert dat mensen moderne ontwikkelingen verwerpen. Maar in werkelijkheid maken mensen afwegingen tussen verschillende aspecten van de veehouderij aangezien zij zich ervan bewust zijn dat hun wensen moeilijk te realiseren zijn. Om veehouderijsystemen te ontwikkelen rondom maatschappelijke voorkeuren kan men burgers vragen om verschillende aspecten en issues te ranken en zo tot een prioriteitenlijst komen. Echter, deze thesis heeft laten zien dat voorkeuren kunnen verschillen tussen groepen mensen. Als gevolg hiervan stellen verschillende groepen mensen mogelijk andere prioriteiten en maken ze andere afwegingen, wat resulteert in andere prioriteitenlijsten. Voor toekomstige studies en systeeminnovaties zou het interessant zijn om verschillende groepen mensen en hun prioriteiten m.b.t. de veehouderij nader te bestuderen.

De thesis heeft ook een aantal implicaties voor **duurzame ontwikkeling** met betrekking tot de manier waarop men duurzame ontwikkeling *benadert* als ook m.b.t. de manier waarop men duurzame ontwikkeling *bestudeert*.

Om te beginnen met de manier waarop men duurzame ontwikkeling *benadert*: de thesis volgde een constructivistische benadering door te kijken naar collectieve betekenissen die onder duurzaamheidsissues liggen. Collectieve betekenissen zijn algemeen geldende ideeën over wat karakteristiek is voor de veehouderij en wat als goed en slecht beschouwd wordt. Men kan deze constructivistische manier van denken doortrekken naar het concept van duurzame ontwikkeling. Duurzaamheid (van de veehouderij, maar ook van andere fenomenen) als een sociale constructie is, in deze opvatting, een set van collectieve betekenissen over wat duurzaam en wat niet-duurzaam wordt beschouwd. Deze constructivistische manier van denken impliceert ten eerste de erkenning dat duurzame ontwikkeling **meerdere betekenissen** heeft die contextafhankelijk zijn. Deze studie richtte zich op de melkveehouderij in Nederland en Noorwegen en voor toekomstig onderzoek zou het interessant zijn om ook naar andere contexten – bv. Zuid Europa, the Verenigde Staten en niet-Westerse culturen – en andere veehouderijsystemen – bv. varkens of pluimvee – te kijken. Daarnaast impliceert de constructivistische benadering de erkenning dat duurzaamheid een **waardegeladen** concept is, dat een continu debat vereist over wat wel en niet duurzaam beschouwd wordt, aangezien

waarden en behoeften in de tijd verschuiven. Collectieve betekenissen van duurzaamheid hebben daarmee betrekking op zowel **niet-duurzame** als **duurzame** aspecten. Terwijl veel duurzaamheidsstudies gericht zijn op wat als niet-duurzaam beschouwd wordt, met als doel duurzaamheid te verbeteren, moet men waardevolle aspecten (d.w.z. positieve aspecten, non-issues) die geen onderdeel zijn van dergelijke duurzaamheidscriteria niet uit het oog verliezen.

De thesis heeft drie implicaties voor de manier waarop men duurzame ontwikkeling van veehouderijsystemen *bestudeert*. Het belangrijkste is een van beperkingen van de constructivistische benadering, namelijk dat het zich vaak alleen richt op de betekenis van fenomenen en daarbij de neiging heeft om de materiële wereld te negeren. Dit houdt in dat men niet alleen naar de **betekenis** van duurzame ontwikkeling moet kijken, maar ook naar waar het betrekking op heeft – het **materiële** aspect. Het vereist een interdisciplinaire benadering om verder inzicht te krijgen in de interactie tussen de betekenis en materie. Dergelijke **interdisciplinaire** studies moeten de expertise van de sociale wetenschappen - over de betekenis - combineren met de kennis van de natuurwetenschappen - over de materie. Ten derde geeft de constructivistische benadering mogelijkheden om **nieuwe onderzoeksmethoden** te ontwikkelen om duurzame ontwikkeling van de veehouderij te bestuderen. Deze thesis bestudeerde sociaal-culturele duurzaamheid van de veehouderij via zintuiglijke ervaringen van burgers gedurende een bedrijfsbezoek. Deze 'real life experience' via bedrijfsbezoeken bleek een geschikte methode om inzicht te krijgen in burgerpercepties en onderliggende betekenissen. Echter, bepaalde issues zoals mondiale en milieu kwesties komen niet boven water via directe perceptie. Voor toekomstig onderzoek kan het daarom waardevol zijn om te zoeken naar manieren om dergelijke issues op een andere manier erbij te betrekken. De gebruikte methodiek in deze studie zou uitgebreid kunnen worden voorbij bedrijfsniveau, bijvoorbeeld door het maken van een tour door de regio kan de ervaring uitgebreid worden van bedrijfsniveau naar regionaal niveau. Tot slot kan een analytisch aspect van deze studie verder ontwikkeld kan worden, d.w.z. zintuiglijke ervaringen van mensen kunnen gedetailleerder bestudeerd worden. In deze studie zijn alle zintuiglijke ervaringen tegelijk geanalyseerd, terwijl uit andere studies bekend is dat ieder zintuig verbonden is aan verschillende betekenissen.



“In my view cows belong outside. A cow is a social animal and needs to have as much opportunity as possible for expressing her natural behaviour in a natural environment.” - NL



“This picture shows that farming should preserve diversity. A farm is a place with living beings and various animal species. It shouldn't be a production factory.” - NO

Appendix I

On-farm questionnaire
about sensory perceptions

1 Smell

2 Hearing

3 Seeing

4 Feelings

5 Conclusion

Location and Farm:

Respondent number:

Some remarks in advance:

- *Questions need to be answered individually*
- *There are no right or wrong answers; it is your experience that counts!*
- *You can write down your answers below the questions. If you need more space, you can make use of the additional paper at the end of this questionnaire.*

1 Smell

Walk around the farm and focus on what you *smell*. What is noticeable? Do you experience this smell in a positive, negative or neutral way? (Please explain your answer).

Smell:.....

Experience: Positive / Neutral/ Negative*

Reason:

Smell:.....

Experience: Positive / Neutral/ Negative*

Reason:

2 Hearing

Close your eyes and focus on the *sounds* you hear. What is noticeable? Do you experience this noise in a positive, negative or neutral way? (Please explain your answer).

Sound:.....

Experience: Positive / Neutral/ Negative*

Reason:

* Cross out whichever is not applicable

Sound:.....
Experience: Positive / Neutral/ Negative*
Reason:

Sound:.....
Experience: Positive / Neutral/ Negative*
Reason:

3 Seeing

Walk around the farm and *look* for things which you find are *valuable* to preserve for the future. Make 10 photographs of things you find *valuable* or *inspiring*. You can write down a short explanation of each photograph below.

Note: Within two weeks you will be requested to select five photographs which, in your opinion, represent the most valuable aspects of this farm. You also will be requested to explain why you have chosen these photographs. The notes below will be sent back to you with the photographs, so you need not write down a full explanation today, just something to function as a reminder. .

- Photo 1.....
- Photo 2.....
- Photo 3.....
- Photo 4.....
- Photo 5.....
- Photo 6.....
- Photo 7.....
- Photo 8.....
- Photo 9.....
- Photo 10.....

4 Feelings

Combine the things which you have just smelt, heard and seen: What *feeling* does this farm evoke? (e.g. happy, sad, cheerful, disappointed, etc.) Do you experience this feeling in a positive, negative or neutral way? Please explain why you feel this way.

Feeling:.....

Experience: Positive / Neutral/ Negative*

Reason:.....

Feeling:.....

Experience: Positive / Neutral/ Negative*

Reason:.....

Feeling:.....

Experience: Positive / Neutral/ Negative*

Reason:.....

5 Conclusion

a. Can you give some examples of things which have *surprised* you today? Which things differed from your expectations? Did you find these differences to be positive or negative? (Explain your answer)

Surprise:.....

Experience: Positive / Negative*

Reason:

Surprise:.....

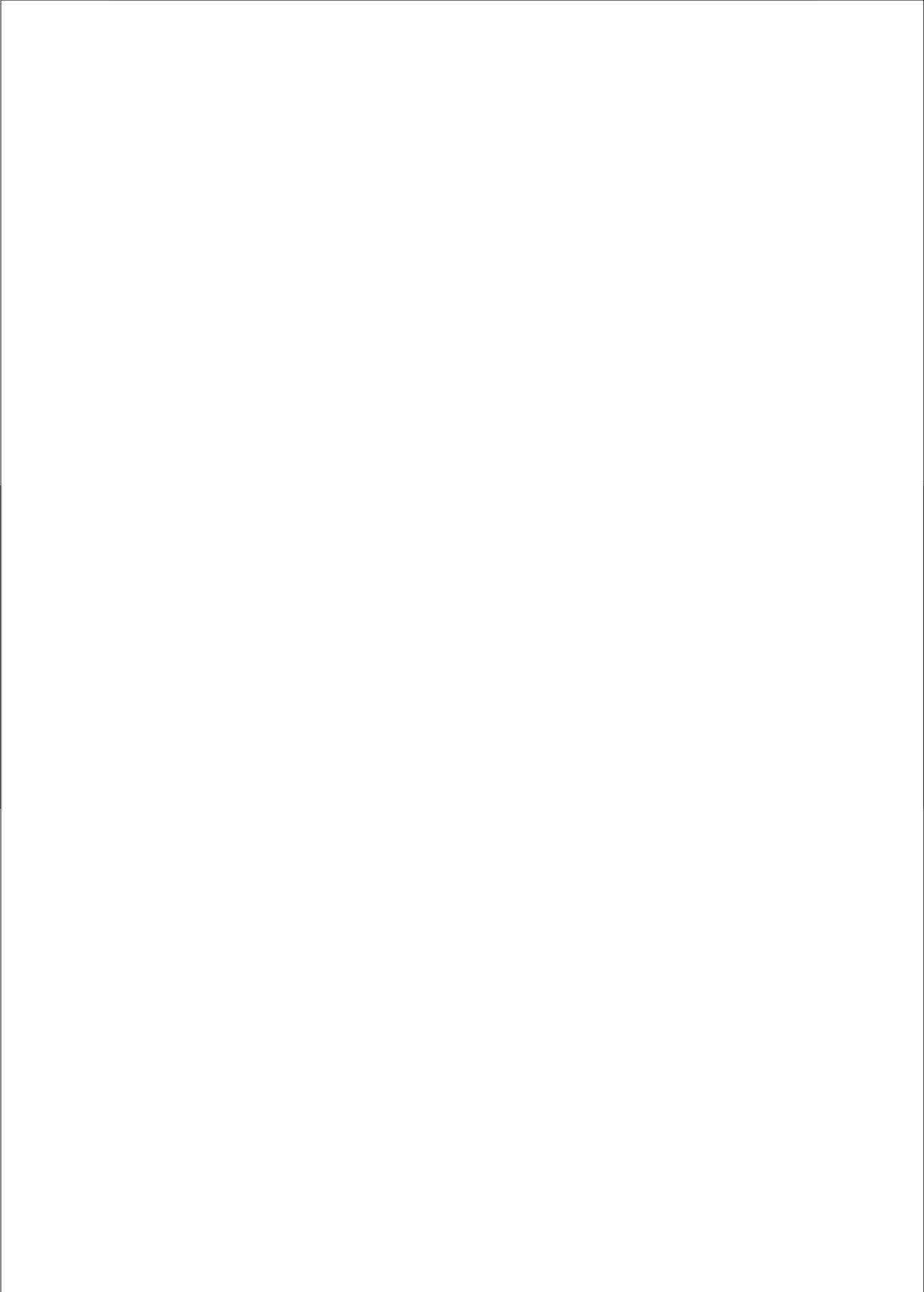
Experience: Positive / Negative*

Reason:

b. Is dairy farming part of Dutch (or Norwegian) culture for you?

If yes, can you explain why? If no, can you explain why not?

Thank you very much for your participation today and for answering the questions!



Appendix II

Quantitative survey on dairy farming
in the Netherlands

Part 1: Image of dairy farming

Part 2: Developments in dairy farming

Part 3: Relation with animals and nature

Part 4: Information about agriculture

Part 5: Socio-economic characteristics

Explanation: This questionnaire is about dairy farming in the Netherlands. It should only take about 20 minutes to answer the questions.

Part I: Image of dairy farming

Explanation:

This part contains 3 questions about your image of *dairy farms* in the Netherlands. A *dairy farm* keeps cows for milk production.

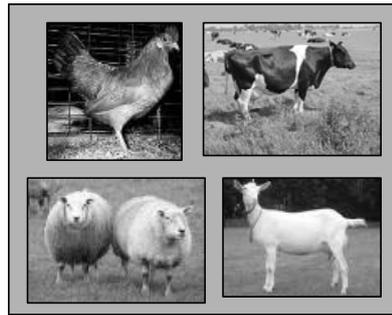
Question 1. What do you think an average dairy farm looks like? Below are pairs of images of a dairy farm (photos A and B). In your opinion which image(s) give *the most realistic image* of an average dairy farm?

- 1: Photo A is the most realistic image
- 2: Photo B is the most realistic image
- 3: Photo A and B are both realistic images
- 4: Neither of these photos give a realistic image
- 9: I really don't know

1. Photo A: One type of animal: cows



Photo B: Several types of animals (cows together with sheep or goats or chickens)



2. Photo A: Manual milking



Photo B: Automatic milking



3. Photo A: Modern living/farm house



Photo B: Traditional living/farm house



4. Photo A: Few silos



Photo B: Many silos



5. Photo A: Cows are inside all year round



Photo B: Cows are frequently in the pasture



6. Photo A: Cows are kept on slatted floors



Photo B: Cows are kept on straw bedding



Question 2. Below are 17 statements about dairy farming. To what extent do you agree with them?

- 1 = I agree completely
- 2 = I agree
- 3 = I agree a little
- 4 = Neutral, I neither agree nor disagree
- 5 = I disagree a little
- 6 = I disagree
- 7 = I disagree completely
- 9 = I really don't know

1. Dairy farming and nature can't go hand in hand
2. Farming life is plain and simple
3. Dairy farmers pollute the environment
4. These days you need higher education to be a dairy farmer
5. Dairy farming is one-sided, focused on producing the maximum amount of milk
6. Dairy farmers spoil the landscape
7. The Netherlands is a front-runner in technological developments for dairy farming
8. Dutch dairy farming is maintained by government subsidies
9. The income of dairy farmers is too low compared to the amount of work they do
10. Modern-day sheds give cows too little space to move around in
11. Dairy farmers take good care of their animals
12. Dairy farms smell bad
13. Dutch dairy farming is unimportant in the international market
14. Nobody wants to become a dairy farmer nowadays
15. The Netherlands can do fine without dairy farmers
16. Life on a dairy farm is healthy for people
17. Dairy farmers do not keep up with times

Question 3. Below are several statements about dairy farms. Please indicate if you think they are true or false (more or less).

- 1 = True
- 2 = False, I think it is *less*
- 3 = False, I think it is *more*
- 9 = I really don't know

1. An average dairy farm has about 65 cows
2. A dairy farm covers the equivalent of about 30 soccer pitches (circa 15 hectares)
3. The Netherlands has about 25,000 dairy farms
4. There are about 1.4 million dairy cows in the Netherlands
5. The largest dairy farm in the Netherlands has about 600 cows
6. A cow gives an average of 15 litres of milk per day

Part 2: Developments in dairy farming

Explanation:

This part contains questions about developments in dairy farming. There are no right or wrong answers to these questions: we are interested in your opinion.

Question 1. Below are 6 developments of dairy farming over *the past 10 years* (1995-2005).
What do you think of these developments?

- 1 = I think it is a *very bad* development
- 2 = I think it is a *bad* development
- 3 = I think it is a *good* development
- 4 = I think it is a *very good* development
- 9 = I have no opinion, It doesn't matter to me

1. A dairy farmer has to do *more* administrative work
2. Large dairy farms can provide *less* time and attention for each animal
3. The number of cows per dairy farm is *increasing* further (from 48 to 65 cows)
4. The land area of each dairy farm is *increasing* further (from 60 to 80 soccer pitches (i.e. from 30 to 40 hectares))
5. The number of dairy farms in the Netherlands is *decreasing* (from 37,500 to 23,500 farms, a loss of about 3 farms per day)
6. The daily milk production per cow is *increasing* further (from 24 to 27 litres, with some cows giving up to 40 litres per day)

Question 2. In your opinion, what does the *ideal dairy farm* look like?
Below are nine pairs of possible options for dairy farming. Indicate which of each pair you think represents the *ideal dairy farm*. It does not matter whether the development is feasible, but it is about which development you would prefer.

- 1 = Development A
- 2 = Development B
- 9 = I really don't know, I can't choose

"I wish"

1. A. that the Netherlands also produces milk for export
B. that the Netherlands only produces milk for the Dutch market
2. A. that a dairy farmer is mainly a manager
B. that a dairy farmer is mainly a 'craftsman'
3. A. that a dairy farm is 'cosy' and a bit messy
B. that a dairy farm is clean and tidy
4. A. that dairy farmer puts his/her economic interest first
B. that a dairy farmer puts the interest of the animals first
5. A. that cows are fed with Dutch feed
B. that cows are fed with feed from abroad
6. A. that dairy farmers only produce milk
B. that dairy farmers also take care of landscape and nature
7. A. that a dairy farm is a family farm
B. that a dairy farm is a commercial company

8. A. that the Netherlands has mainly large dairy farms (more than 100 cows)
B. that the Netherlands has mainly small dairy farms (less than 100 cows)
9. A. that a dairy farm is different from other businesses because it involves animals
B. that a dairy farm is similar to other business companies

Question 3a. Below are 7 'if-then' propositions about dairy farming.
To what extent do you agree with each proposition?

- 1 = I agree completely
- 2 = I agree
- 3 = I agree a little
- 4 = Neutral, I neither agree nor disagree
- 5 = I disagree a little
- 6 = I disagree
- 7 = I disagree completely
- 9 = I really don't know

1. If strict regulations are necessary for things like animal welfare and environmental issues, then it is acceptable that a dairy farmer has less freedom
2. If it is necessary to keep a farm profitable, then it is acceptable that a dairy farmer has to put economic interest above the animals' interests
3. If a dairy farmer works hygienically, then a little mess is acceptable
4. If farms can only exist with governmental subsidies, then it is acceptable that dairy farmers receive subsidies
5. If the costs of keeping a cow become higher than the profit it (she) generates, then it is acceptable that a farmer brings that cow to the slaughterhouse.
6. If it is necessary for the financial continuation of the farm, then it is acceptable that cows are kept inside all year round.
7. If it is too expensive to produce milk in the Netherlands, then it is acceptable that dairy farms disappear (from the Netherlands).

Question 3b. Below are 6 'if-then' propositions about dairy farming.
To what extent do you agree with each proposition?

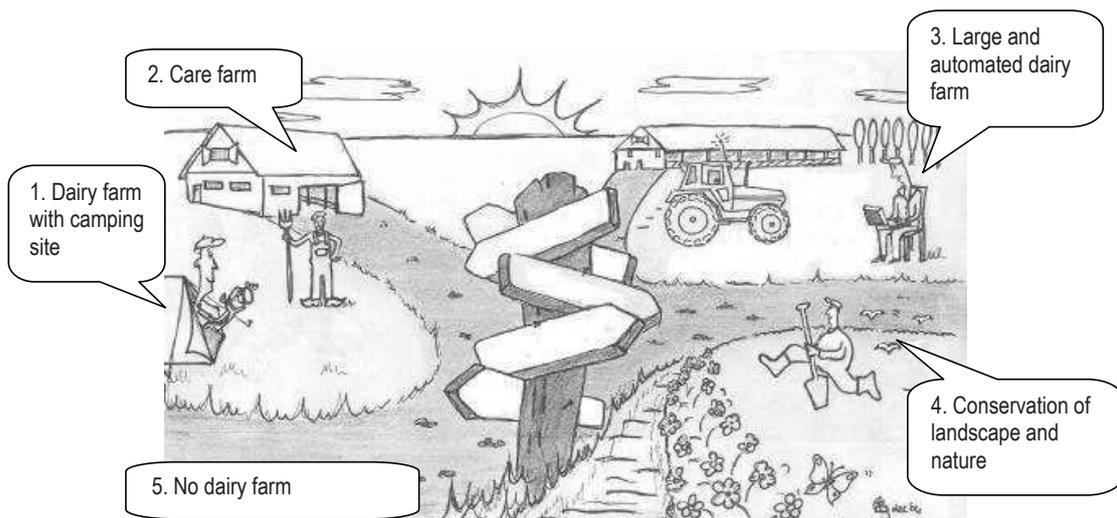
1. If it is efficient and practical for a dairy farm, then it is acceptable that a calf grows up without a dam.
2. If it is efficient and practical for a dairy farm, then it is acceptable that cows are artificially inseminated (instead of being serviced by a bull)
3. If it is efficient and practical for a dairy farm, then it is acceptable that banks with hedges are removed.
4. If it is efficient and practical for a dairy farm, then it is acceptable that a dairy farm has 3000 dairy cows and uses milking robots.
5. If it is efficient and practical for a dairy farm, then it is acceptable that a dairy farmer does not have daily contact with the animals.
6. If dairy farms become larger, then it is acceptable that the number of family farms decreases.

Question 3c. Below are 3 'if-then' propositions about dairy farming.
To what extent do you agree with each proposition?

1. If imported milk is cheaper than Dutch milk, then I will buy imported milk.
2. If Dutch milk is of better quality than imported milk, then I will pay more for Dutch milk.
3. If dairy farmers take care of nature and landscape, then I will pay for it.

Question 4. The picture below shows five possibilities for the future of a Dutch dairy farmer.
Which of these possibilities appeals most to you? (You may select more than one)

- Possibility 1: Dairy farm with camping site
- Possibility 2: Care farm (dairy farm where people take care of old, ill or handicapped people)
- Possibility 3: Large and automated dairy farm
- Possibility 4: Conservation of landscape and nature (dairy farm where the farmer also takes care of the landscape and nature)
- Possibility 5: No dairy farm
- It does not matter to me



Question 5. How important do you consider the following 8 arguments for maintaining dairy farming in the Netherlands?

- 1 = I think this is a *very important* argument
- 2 = I think this is an *important* argument
- 3 = I think this is an *unimportant* argument
- 4 = I think this is a *very unimportant* argument
- 9 = I really don't know

"I think dairy farms in the Netherlands be should maintained"

1. because we can not know for sure how imported milk is produced
2. because we have the best dairy farmers in the world
3. because I like to see cows in the pasture
4. because farming traditions should be maintained
5. because black-and-white cows should remain as a symbol for the Netherlands
6. because the Netherlands is famous for its cheese and milk.
7. because people should be able to learn where milk comes from
8. because dairy farms contribute to 'quiet and space' in the countryside

Question 6. Below are 10 preconditions for a dairy farm in the future. To what extent are these preconditions important to you? On a scale of 1-10 rank the level of importance of these. You can use the same mark several times.

1 = not important at all

....

10 = extremely important

"The dairy farm of the future"

1. ...should produce enough and safe food
2. ...should develop and apply the latest technologies
3. ...should generate a reasonable income for the dairy farmer
4. ...should handle/treat animals well
5. ...should take care of the landscape
6. ...should protect nature (e.g. plants and birds)
7. ...should not pollute the environment
8. ...should preserve typical farming characteristics (e.g. family farm)
9. ...should preserve Dutch culture and identity
10. ...should supply services to society, such as 'quiet and space' and recreation possibilities

Part 3: Relation with animals and nature

Explanation: The following questions are about the way you see the relation between humans, nature and animals.

Question 1. With which of the following descriptions do you most agree with? (Only one answer)

"I think it is principally right that"

- Humans are superior to animals
- Humans and animals are equal
- Humans are subordinate to animals

Question 2. With which of the following descriptions do you most agree with? (Only one answer)

"I think it is principally right that"

- Humans use and dominate nature
- Humans live in harmony with nature
- Humans are subordinate to nature

Question 3. To what extent do you agree with the following 6 propositions?

- 1 = I agree completely
- 2 = I agree
- 3 = I agree a little
- 4 = Neutral, I neither agree nor disagree
- 5 = I disagree a little
- 6 = I disagree
- 7 = I disagree completely
- 9 = I really don't know

1. Human life is of higher value than animal life
2. It is acceptable to keep animals for the production of food
3. In the Netherlands, pets have a better life than cows on a dairy farm
4. Humans can not create nature
5. 'Real wild nature' does not exist in the Netherlands
6. A pasture with cows is nature

Part 4: Information about farming

Explanation: The following questions are about Dutch agriculture in general (including animal farming, arable farming and horticulture)

Question 1. How are your opinions about agriculture formed? (More than one answer possible)

- Via family and/or friends
- Via radio, television or newspapers
- Via magazines or books
- Via internet
- Via an excursion or open house/day
- Via voluntary work
- Via the adoption of a cow, chicken, apple tree (or anything similar)
- Via my child, who are made aware of agriculture at school
- Other, namely
- I have no opinion about agriculture

Question 2. Do you have a need for information about animal farming?

- Yes
- No

Question 3. Do you have a need for information about arable farming or horticulture?

- Yes
- No

Question 4. Have you ever specifically searched for information about agriculture?

- Yes
- No

Question 5. Have you ever visited a farm?

- Yes, continue with question 6
- No, continue with question 8

Question 6. What was your primary experience of your most recent farm visit? (one answer)

- It was pleasurable
- It was educative
- It was not very special
- Others; It was.....

Question 7. Did your opinion about agriculture change due to the farm visit? Indicate for the 6 six topics below if your opinion changed.

- 1 = Yes, my opinion changed positively
- 2 = Yes, my opinion changed negatively
- 3 = No, my opinion did not change
- 0 = Not applicable

1. The image of farmers
2. The image of organic farming
3. The image of intensive animal farming (pigs, poultry)
4. The handling of animals in animal farming
5. The environmental effects of agriculture
6. The origin of my food

Question 8. Did you watch the television programme 'Farmer seeks a wife'?

- Yes
- No
- I don't know that programme

Question 9. When do you see a 'typical Dutch landscape' (pasture, cows, farms)?
(more answers possible)

- When I travel by train
- When I travel by car
- When I travel by motor cycle
- When I go for a walk
- When I go for a run
- When I cycle
- When I travel on water (e.g. by canoe, sailing boat or motorboat)
- When I camp
- When I visit a farm
- When I visit a farm shop
- Other.....

Question 10. How often do you see this 'typical Dutch landscape'?

- Every day
- One to several times per week
- One to several times per month
- One to several times every six months
- One to several times per year

Question 11. How much value do you attach to this landscape?

- Much value
- A little value
- No value
- It does not matter to me

Part 5: Socio-economic characteristics

Explanation: To conclude we have a few more questions about your personal circumstances.

Question 1. Did you grow up in the Netherlands?

- Yes
- No

Question 2. In what kind of area did you grow up?

- Strongly urban area
- Urban area
- Moderate urban area
- Non-urban area/rural area

Question 3. What is your cultural background?

- Dutch
- Antillean
- Moroccan
- Surinamese
- Turkish
- Other.....

Question 4. What is your religious denomination?

- Dutch reformed
- Reformed
- Catholic
- Muslim
- Buddhist
- Hindu
- Other.....
- I am not religious
- I prefer not to say

Question 5. Are you a vegetarian?

- Yes
- No
- Sometimes

Question 6. What pet(s) do you own? (Tick all relevant boxes)

- Dog
- Cat
- Rodent (e.g. Rabbit, Guinea pig)
- Bird
- Reptile (e.g. Turtle, Snake)
- Fish
- Horse
- Goat or Sheep
- Chicken
- Other.....
- I don't have pets

Question 7. Do you (or have you) work(ed) in the agricultural sector?

- Yes
- No

Question 8. Do you have friends, family or acquaintances who work in agriculture?

- Yes
- No

Questions 9. Do you feel connected with the agricultural sector?

- Yes, I feel strongly connected
- Yes, I feel slightly connected
- No, I feel hardly connected
- No, I don't feel connected
- I don't know

Question 10. Are you a member of a nature or environmental organisation?

- Yes
- No

Question 11. Are you a member of an animal (rights) organisation?

- Yes
- No

Question 12. This questionnaire covered several different topics. You may have felt that some topics were addressed insufficiently. If so, please add your own comments below.

Thank you very much for participating in this research!



About the author

Epilogue

My personal PhD-journey: from Beta to Gamma and back again

Introduction

In this epilogue I look back on my personal experiences as an interdisciplinary researcher during my PhD-project. There are three reasons why I decided to write this personal 'non-scientific' epilogue. First of all, I want to illustrate that interdisciplinary research is not easy to put into practice, as it involves an interdisciplinary researcher understanding and combining two (or more) disciplines. For me this required a shifting from thinking like an animal scientist towards a more sociological way of thinking and then finding ways to combine the two. Second, insights from my interdisciplinary journey may be valuable to other interdisciplinary researchers, who might recognize some common aspects. Finally, I want to illustrate that interdisciplinarity does not only occur between people, but also, and moreover, **within people**. I experienced many internal 'dialogues' between two sides in me: a more animal science-oriented side (let's call her "Beta-Bir") and a more social science-oriented side (let's call her "Gamma-Git"). The text below uses an imaginary dialogue between (Beta-) Bir and (Gamma-) Git to illustrate this personal development. In general, I experienced four phases of development over the six years of this project: the first acquaintance, an idolization of social sciences, going back to my roots and the challenge of cooperation.

The first acquaintance

Bir starts by saying: "In the first few years of the project you were quite silent and kept yourself in the background. The first two papers were mainly based on my input as an animal scientist. But during the third paper you came to the front! You started asking complex questions about underlying social and cultural meanings. I found it difficult to deal with them. I was willing to learn about sociology, but at the same time I felt insecure and confused. I had never done something like that before and there were so many uncertainties. Would sociology bring me valuable insights? Would I be able to understand its jargon? What about its way of reasoning and the (long) papers? Won't it turn my world upside down? What if".

"Yes" Git interrupts "I understand it was a very difficult step for you to switch to sociology. It raised many uncertainties about everything you had learned over the last decade. And it felt as if you had to start all over again. But for me it was different, I had already been walking around for a few years asking questions about the social and cultural meanings of animal farming, and for me this was an unique opportunity to read and learn about sociological studies on this topic. I listened to your 'What if-

arguments for a while and got the feeling they were mainly based on (to some extent, reasonable) fear – fear of the unknown and the consequences for your existence. What if sociology turned out to be great and your expertise wouldn't be needed anymore... In the meantime I became increasingly curious in everything rural sociology had to offer. A whole new discipline was waiting for us to be explored!"

Idolization of social sciences

Bir responds, slightly annoyed: "Oh, I remember that phase very well. My fears became partly true, because you paid so much attention to your newly discovered discipline that you had no thought for other things anymore."

Git laughs "I still remember the sarcasm in your voice, when I started reading. But it did not dampen my enthusiasm and I devoted myself to the sociological literature. For years, I had been craving for these books and papers without knowing it. I soon learned that reality is socially constructed, resulting in multiple realities."

"That was really a hard time for me," Bir responds "I was so used to animal science, which is a natural science and based on the belief in one reality. Moreover, I had always tried to explain everything in a straightforward way - preferably in terms of 'causality'. And this 'social con-something' was so different from what I'd been used to do!"

"Yes, it was a tough time for you, but - to be completely honest to you - I had a great time. Not to see you struggling with these new insights, but to discover that other people actually had similar questions to the ones I had for many years. It felt a bit like coming home, to a place where I belong."

Bir replies "Well, that might explain why your enthusiasm for sociology was so inexhaustible and you seemed impervious to my arguments. But - to be also completely honest to you - at that time we were really drifting apart and I had doubts if we could ever work together. Above all, I missed my roots."

Back to my roots

Git: "After a while my apparently limitless appetite for sociological literature seemed to have reached its maximum (at least temporarily). I couldn't see the wood for the trees or the social construction of nature anymore. You gave me a thorough shake-up with the words "*It is not going to work like this. We are supposed to work together, this an interdisciplinary study, remember!?*" It was good you did so, because we did need to work together to finish this project. You should know that I didn't mean to ignore to you, I merely got sucked into the literature, I am sorry."

"Well...it is okay, via that literature you gained a lot of valuable and interesting insights for our third paper. But I must admit that I had difficulties understanding the texts you wrote. Your writing-style was so 'woolly', that I hardly could understand your arguments, as if they were somehow hidden under the

words. It is okay that you wanted to write in a more sociological style, but did it have to become so vague as well?"

Git smiles slightly "No, I had to learn to write in another style, because your style was so functional and straight to the point. But at the same time I was also a bit insecure with making an argument, because I had never done it like that before."

Bir responds friendly: "I noticed. Luckily, you developed that style further in the fourth paper. Moreover, that paper required statistical analysis. I was so happy to be in contact with my roots again, because I love to do calculations. At that time I had the feeling we were coming together again."

Git with a broad grin: "I am really happy you did the analysis, it is not my type of job. It took some time to develop a writing style in which I dared to rely on myself and clarify our points with well-thought and written argumentation. I was nice to notice that we could combine our strengths in the fourth paper. I was satisfied with the result."

"Me too" says Bir "and your idea to submit that paper to a sociological journal sounded good to me."

The challenge of cooperation

Git: "Yes, it would have been great if that journal had accepted a more interdisciplinary and empirically-based paper, but unfortunately it was rejected. The reviewers thought the paper was too empirical and not sufficiently embedded in the theory. I am sorry Bir, I did my best on the theory, but apparently it was not sufficient. I am a sociologist, but not a 'core theoretical one'."

"It is okay. I feel what you mean. I am not really a 'core'-animal scientist either. You opened my eyes and showed me so many new things. I can not close them and 'forget' what I've seen."

"That is nice to hear, but it also feels a bit strange: Finally you and I manage to work together instead of arguing, and then the reward of that process is rejection for publication."

Bir: "Don't be too disappointed about the rejection. The journal we submitted it to was very sociological. We will find another journal, which is more open towards interdisciplinary studies. It is a matter of keeping faith in ourselves and our study."

"Yes, you're right. From other researchers I understood that this is a common problem with interdisciplinary studies. It is not only challenging to conduct interdisciplinary research but also to get it published."

Git continues: "Looking back, I realize we have given each other some tough times. Yet, I am happy we got to know each other and found a way to work together."

Bir: "I can't work without you anymore, although it has not been (and will not be) easy to work with each other since we are so different. It's a kind of love-hate relationship, yet I think we have got onto

smoother waters now. I want to keep working (and discussing) with you in the future.”

Git: “I enjoyed writing the final chapters of the thesis with you and - whatever the future brings - I am confident that our connection remains and hopefully even grows.”

To conclude

Interdisciplinary research is often recommended as a promising way to address complex real-life problems, but merely combining two disciplines in one research project does not guarantee an interdisciplinary result. Instead, the researcher has to undergo an internal shift in order to understand and combine the two disciplines. One could compare it with making a painting: If one discipline is represented by blue paint, and the other one by red paint, then the final piece of art might be more blue than red (or vice versa) and will also contain purple. Even though the above dialogue separates my blue and red sides, it should be clear that this thesis is a result of a process of learning and interaction between the two sides. In the end, the result is purple, in which some people might recognize a few dashes of blue or red.

Dankwoord

Beste lezer,

Uit de epiloog blijkt reeds dat de weg naar dit proefschrift heel wat 'hobbeler' was dan ik in eerste instantie dacht. Echter, de steun en het vertrouwen van mensen in mijn omgeving maakten de weg een stuk beter begaanbaar. In dit dankwoord wil ik daarom graag enkele personen bedanken voor hun bijdrage aan het project en mijn persoonlijke ontwikkeling.

Om te beginnen, Simon Oosting en Bettina Bock. Het is al fijn als een promovendus één toegewijde en betrokken begeleider heeft, maar twee is uitzonderlijk! Interdisciplinair onderzoek vraagt om onderzoekers die in staat zijn hun eigen discipline grens te overstijgen. Op jullie eigen wijze zijn jullie daarin een voorbeeld voor mij en hebben daarmee enorm bijgedragen aan het project en mijn persoonlijke ontwikkeling. Ik ben jullie dan ook ontzettend dankbaar voor jullie inzet, enthousiasme en advies in de dagelijkse begeleiding!

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Voor het veldwerk in Noorwegen en Nederland wil ik allereerst de melkveehouders bedanken voor de gastvrije ontvangst op hun bedrijf. Voor de organisatorische hulp bij het veldwerk in Nederland ben ik Dieter Verhue, Martin de Bruin en Maud Adriaanse van Bureau Veldkamp en Daniël de Jong dankbaar. En natuurlijk Fokje Steenstra voor de hulp bij de voorbereiding, de catering en het maken van de foto's tijdens de bedrijfsbezoeken! Voor het Noorse veldwerk gaat mijn dank uit naar Erling Krogh voor de organisatie, Odd Jarle Stener Olsen voor het contact met de melkveehouders en Solveig van Nes voor het vertalen van de vragenlijsten naar het Noors.

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Marit, you gave my period in Norway a colorful touch. Thank you for the inside-Norwegian-culture experiences, but above all 'tusentak for det gode vennskapet'!

Wietze, dankjewel voor je liefde, zorg en vertrouwen van de afgelopen jaren.

Pap en mam, dank voor de opvoeding waarin jullie mijn zelfstandigheid en de mogelijkheden om door te leren altijd sterk gestimuleerd hebben.

Frits en Petra, wat fijn en bijzonder dat jullie in het leven en op het podium aan mijn zijde staan.

Britt, dankjewel voor je hulp bij het organiseren van de feestelijkheden rondom deze mijlpaal!

En als laatste Opa, levenskunstenaar. Het boekje is eindelijk af, maar je mag het helaas niet meer meemaken. Jouw levenslessen hebben op velerlei manieren aan mijn ontwikkeling bijdragen, vandaar dat ik het aan jou opdraag.

Birgit

Curriculum Vitae

Birgit Katharina Boogaard was born on the 13th of April in 1979 in Nijmegen. She attended the BC Schöndeln secondary school in Roermond, where most of the subjects she chose were beta-oriented.

She started studying Animal Science in 1997. For her specialization on Tropical Animal Production Systems she worked for six months at the International Trypanotolerance Centre (ITC) in the Gambia, studying the consumption of goat milk in the area of Bansang. She later focused her attention on Western animal production systems and carried out a study of Dutch dairy farmers' requirements for knowledge. This study was conducted in collaboration with the Communication and Innovation Group of Wageningen University and the LTO (Land- en Tuinbouw Organisatie), a Dutch farmers' organization. She finished her Masters study in 2003 with a thesis on smallholder dairy farming systems in Brazil based on rotational pasture and sugarcane production. This research was conducted in collaboration with the Centre of Agrarian Sciences in Araras at the Federal University of São Carlos (UFSCar).

In October 2003 she started her PhD research with the Animal Production Systems Group and Rural Sociology Group of Wageningen University, carrying out field work in the Netherlands in 2005 and in Norway (at Section for Teaching and Teacher Education of the University of Life Sciences in Ås) in 2006. This work has already resulted in several scientific publications and contributions to international conferences.

Birgit Boogaard is currently working at the Social Sciences Group (Rural Sociology) and the Animal Sciences Group (Livestock Research) of Wageningen University and Research Centre.

Publications

Journal papers

Boogaard, B.K., Oosting, S.J., Bock, B.B., 2008. Defining sustainability as a socio-cultural concept: Citizen panels visiting dairy farms in the Netherlands. *Livestock Science*. 117(1) pp. 24-33.

Boogaard, B.K., Oosting, S.J., Bock, B.B., 2006. Elements of societal perception of farm animal welfare: A quantitative study in The Netherlands. *Livestock Science*. 104 pp.13-22.

Conferences papers

Boogaard, B.K., Oosting, S.J., Bock, B.B., Krogh, E., 2007. Socio-cultural themes of dairy production systems: A comparison of Norwegian and Dutch society. *XXII Congress for European Society of Rural Sociology*, Wageningen, The Netherlands.

Boogaard, B.K., Oosting, S.J., Bock, B.B., 2006. Socio-cultural issues of dairy production systems in the Netherlands assessed through farm visits with citizen panels. *The 57th Annual Meeting of the European Association for Animal Production*, Antalya, Turkey.

Abstracts in conference proceedings

Boogaard, B.K., Oosting, S.J., Bock, B.B., 2009. Social and cultural meanings of livestock farming in Western societies. In: *Proceedings of 60th Annual Meeting of the European Association for Animal Production*, Biodiversity and Sustainable Animal Production Systems. Barcelona, Spain. Wageningen Academic Publishers, the Netherlands.

Boogaard, B.K., Oosting, S.J., Bock, B.B., 2009. The social construction of animal farming: interaction between meaning and materiality. In: *XXIII ESRS Congress of the European Society for Rural Sociology*. Re-inventing the rural. Between the Social and the Natural. Vaasa, Finland.

Boogaard, B.K., Oosting, S.J., Bock, B.B., 2009. Naturality of farm animals as a prerequisite for welfare – different perspectives between Dutch and Norwegian citizens. In: *Welfare Quality International Conference*. Knowing Animals: cross-fertilisation between natural and social sciences for understanding the quality of life of animal. Florence, Italy.

Boogaard, B.K., Oosting, S.J., Bock, B.B., Krogh, E., 2007. Socio-cultural themes of dairy production systems: A comparison of Norwegian and Dutch society. In: *XXII ESRS Congress of the European Society for Rural Sociology*. Mobilities, Vulnerabilities and Sustainabilities: New questions and challenges for rural Europe, Wageningen, The Netherlands.

Boogaard, B.K., Bock, B.B., Krogh, E., Oosting, S.J., 2007. A comparison between Norwegian and Dutch dairy production systems with regard to their socio-cultural sustainability. In: *Proceedings of the 58th Annual meeting of the European Association of Animal Production*, Dublin, Ireland. Wageningen Academic Publishers, the Netherlands.

Boogaard, B.K., Oosting, S.J., Bock, B.B., 2006. Importance of emotional experiences for societal perception of farm animal welfare: A quantitative study in the Netherlands. In: *Congress of the European Society for Agricultural and Food Ethics*. Ethics and the Politics of Food. Wageningen Academic Publishers, the Netherlands

Boogaard, B.K., Oosting, S.J., Bock, B.B., 2006. Socio-cultural issues of dairy production systems in the Netherlands assessed through farm visits with citizen panels. In: *Proceedings of 57th Annual Meeting of the European Association for Animal Production*, Antalya, Turkey. Wageningen Academic Publishers, the Netherlands.

Boogaard, B.K., Oosting, S.J., Bock, B.B., 2006. Socio-cultural issues of dairy production systems in The Netherlands: Results of farm visits with six citizen panels. In: *7th European International Farming Systems Association symposium*. Changing European farming systems for a better future: New visions for rural areas. Wageningen Academic Publishers, the Netherlands.

Other publications

Boogaard, B.K., Krogh, E., 2006. Folk til gards! Resultater fra gårdsbesøk med to grupper fra Vestfold Wageningen, Wageningen UR, the Netherlands.

Boogaard, B.K., 2006. Met burgers de boer op! Resultaten van bedrijfsbezoeken met burgerpanels Wageningen, Wageningen UR, the Netherlands.

Boogaard, B.K., Bock, B.B., 2006. Knuffeldier of Knakworst? Meningen van Nederlanders over dierenwelzijn in de veehouderij. BLIND! Online interdisciplinair tijdschrift 2006 (9).

COMPLETED TRAINING AND SUPERVISION PLAN

Birgit Boogaard



Description	Institute / Department	Year	ECTS*
Research Skills Training			
Preparing PhD research proposal		2004	3,0
In-Depth Studies			
Philosophy of science and/or ethics	WIAS	2004	1,5
Research Methodology	MG3S	2004	3,0
Complex dynamics in and between social and ecosystems	CERES & SG	2004	2,0
Nutrition and Sports	VLG & WIAS	2004	1,5
Design of Animal Experiments	WIAS	2005	1,0
Professional Skills Support Courses			
WIAS Introduction Course	WIAS	2004	1,5
Techniques for Scientific Writing	WIAS	2004	1,2
Time Planning and Project Management	WSG	2004	1,0
Endnote	Library	2004	1,0
Professional Communication Strategies	WSG	2005	1,0
Competence Assessment	WSG	2006	0,3
Course Norwegian Language	Adult Education Nijmegen	2005	2,0
Workshop Career coaching	WIAS	2007	0,3
Media Training Course	NWO	2007	0,3
Didactic Skills Training			
Course on Lecturing	OWU	2004	1,0
Course Supervising MSc thesis work	OWU	2004	1,0
Basic course Didactics	OWU	2005	3,0
Lectures for 'Future Livestock Systems'		2004-'08	4,1
Lectures for 'Understanding Rural development'		2004-'06	1,8
Supervising Bsc and MSc Students		2004-'05	4,5
Scientific Exposure			
XI World Congress of Rural Sociology, Trondheim, Norway		2004	1,5
Social science study days, Amsterdam		2004	0,3
WIAS and APS Seminars Wageningen		2005	0,6
IFSA Conference, Wageningen (incl. poster presentation)		2006	2,2
EURSAFE Conference, Oslo, Norway (incl. oral presentation)		2006	1,9
EAAP Conference, Antalya, Turkey (incl. oral presentation)		2006	2,2
EAAP Conference, Dublin, Ireland (incl. oral presentation)		2007	2,2
ESRS Conference, Wageningen (incl. oral presentation)		2007	2,5
WIAS Science days, Wageningen (incl. poster and oral presentation)		2005-'08	3,5
<i>Additional presentations</i>			
APS & RSO Staff colloquia		2004-'07	1,0
Seksjon for læring og lærerutdanning, UMB, Ås, Norway		2006	1,0
Animal Sciences, UMB, Ås, Norway		2006	1,0
Centre for Rural Studies, Trondheim, Norway		2006	1,0
Total (minimum 30 ECTS)			56,2

* One ECTS credit equals a study load of 28 hours



Colophon

Cover painting by Birgit Boogaard

Cover picture by Maartje Roelofsen

Photos by Fokje Steenstra and Dutch and Norwegian panel members of the research, illustrated with quotations of the Dutch (NL) and the Norwegian (NO) panel members

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