

# Cultural Comparison about Camel Welfare between Animal Scientists and Ethiopian Pastoralists

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## **Title page**

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## **Preface**

This minor thesis is part of my master Animal Sciences. The last three summers I performed volunteers work in India, Malawi and Moldova, since the interaction between animals and humans has fascinated me a lot. As a consequence I am always looking around (especially in developing countries) to see how farmers are handling their animals. This always gives me tremendous food for thoughts and every answer evokes more questions. The Rural Sociology Group gave me the opportunity to explore one of my many questions and I am very thankful for this opportunity.

I am an Animal Scientist and writing a sociological thesis was a big challenge for me. Therefore I would like to thank Birgit Boogaard and Paul Hebinck for their patience, advice and helpful feedback during the process of writing my thesis. I learned a lot about several sociological aspects which are very useful for the rest of my Animal Sciences master and I am very glad with that.

## **Summary**

In this research a cultural comparison is made about camel welfare between animal scientists and Somali pastoralists in Ethiopia. On basis of a literature study, the animal scientific culture and the Somali pastoral culture are elaborated and compared with each other with a focus on camel welfare. To delineate camel welfare more, the literature study is focused on mastitis which is a common camel welfare problem. The theoretical framework is based on the theories of sociology of knowledge (Berger and Luckmann, 1974), theory of culture (Douglas, 2004) and theories of world views and criteria of good life for animals (Fraser, 2008).

The aim of the comparison was to find out whether there is some interaction between the two cultures and if the two cultures influence each other. Results are that there is less interaction between the two cultures and that there are communication problems. Animal scientists have to integrate more in the traditional Somali pastoral culture, so that the two cultures can share their common knowledge. Herewith the potential solutions that animal scientist has for problem situations, like mastitis, can be specified to the daily routine of life of the pastoralists. Another important result is that empirical knowledge needs to integrate more in scientific researches, because this knowledge is a very valuable resource that is needed in researches to camel welfare.

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## 1. Introduction

On the basis of an own experience I start this chapter:

*In the summer of 2010 I did voluntary work in Moldova. In the village Falesti, there was a shepherd with a herd of sheep and goats. As a student in Animal Sciences I observed the herd. One sheep was conspicuous. The sheep was limping on three legs and it was clear that the ewe has not used her leg for a while, see figure 1.1.*



Figure 1.1: Shepherd in Falesti, Moldova (Senne, 2010)

*I thought: ‘Why is that sheep still alive? In the Netherlands the ewe should be brought to the slaughterhouse, because it is not animal friendly to keep a sheep that only has three legs to walk. Additionally, it will cost a lot of energy to walk on three legs and the ewe will not optimally produce milk. After observing the herd a couple of days my thoughts changed. Maybe the sheep produced less milk, but the ewe was still possible to reproduce new offspring for the herd. So why should the shepherd kill the ewe only because of the fact that she limps on three legs?’*

After I came home I started thinking about animal welfare and poor countries. As an animal scientist I learned what good animal welfare is like and I learned what good animal production systems are. However, are these so-called ‘good animal welfare’ and ‘good animal production systems’ also applicable in unusual situations? Does culture have a role in animal welfare situations? The most important question that I had was: How can I, as animal scientist, adapt solutions to circumstances in case of animal welfare in developing countries?

On the basis of these questions I have performed this literature study about the relation between culture and animal welfare. Therefore I have investigated what the differences and similarities are between animal scientists and locals of a developing country about animal welfare. This research focuses on welfare of farm animals, also called livestock. To delineate this research, I choose one farm animal to focus on and that is the camel.

So this research focuses on camel welfare in Ethiopia. In Ethiopia camels and cattle are the fundamental resources for pastoral families. Except the fact that livestock plays a big role as a provider of money and food; draught power, manure and hides are also used (Sumberg, 2002). When camel herds are reduced because of environmental circumstances, like drought, hurricanes etc., it will have short- and long-term effects on families (Carter *et al.*, 2007).

In this paper I investigated the differences and similarities between animal scientists and Somali pastoralists in Ethiopia on basis of a literature study. In the literature study focused on two aspects: culture and animal welfare. During this research the culture of animal scientists and pastoralists in Ethiopia are elaborated and compared with each other with a focus on camel welfare. The aim of the comparison is to find out whether there is some interaction between the two cultures and whether the two cultures influence each other.

Within camel welfare I am focussing on mastitis, which is a common camel welfare problem. Mastitis is a disease which causes inflammations to udders of female camels. It is normal that in the animal scientific culture, animal scientists and veterinarians are searching for evidence for typical behaviour of animals and are searching for solutions for physical problems or problems in the animal production industry. This is understood by Fraser (2008) as evidence-based falsification. This evidence-based falsification also happens in case of mastitis, for example by doing somatic cell count in milk. Actually science is an important source of beliefs in the western scientific culture, but it is only one source (Fraser, 2008). In Ethiopia tradition, culture and authority are differently important sources of beliefs. The criterion of evidence-based falsification creates an important difference between scientific beliefs and those that are accepted on the bases of tradition or authority (Fraser, 2008).

The aim of this research is to compare the visions of scientists and Somali pastoralists in Ethiopia about camel welfare. This is a literature study which has its limitations. I chose for a literature study, because of the fact that I had no time to collect my own data. This makes it more difficult to compare the cultures in case of animal welfare, however, there is plenty information available about the two cultures which will help me to complete this literature study.

The outline of the thesis is as follows. In the first chapter I develop a theoretical framework of my research in which I define what culture is and what animal welfare is on the basis of theories of scientists, like Douglas (2004) and Fraser (2008). Also the definition of the

problem will be given. After that I elaborate the animal scientific culture and the Somali pastoral culture in Ethiopia. At the end I will analyse these two cultures and draw a conclusion from it.



## 2. Theoretical Framework

In this chapter the theoretical framework for my research is elaborated. The aim of my research is to make a cultural comparison about camel welfare between animal scientists and Somali pastoralists. Problem is that there are cultural differences in the way they think about good animal welfare. Two complicated questions that arise now are:

- What is culture?
- What is animal welfare?

These two questions are central questions in my research which repeatedly come back during this research. They form the basis of my research. Theories that are used to handle these two questions are formulated by different scientists like Douglas (2004) and Fraser (2008). The theory of Douglas is related to the questions about culture and the theories of Fraser are related to the questions about animal welfare. First the question and theory about culture are explained and then the question and theory about animal welfare are explained.

### 2.1 *What is culture?*

In this research the animal scientific culture (shaped by animal scientist and veterinarians) and the local culture in Ethiopia (shaped by local people and farmers) are compared with the focus on animal welfare. It is important that the two cultures understand each other, because when there are problems with animal health and wellbeing, animal scientists can help local people to find solutions for these problems. However, culture is a broad concept and therefore it is important to describe and define the definition 'culture' in this research. Therefore, I use approaches and theories of sociology of knowledge and Douglas's (2004) theory of culture.

In general, humans are social creatures, who live together in a society in daily life. A human can only survive when he looks, listens to and learns from other humans, because a lonely person is too weak to survive. So people live together with other members of the society. Through practices they will copy and develop specific cultural values (Berger and Luckmann, 1974). As such, a person learns and adopts ideas, beliefs, values and norms of people who are surrounding him. Hence, culture is formed by the practices in daily life and the reality of daily life. People live with other people in a common world, which shows similarities in thoughts and feelings about happenings in daily life (Berger and Luckmann, 1974). Almost every human takes the reality of daily life for granted and after a while the daily happenings, practices and learning processes are normal and common (Jager *et al.*, 2004). So practices of specific cultural values induce learning processes. Besides that a person learns and adopts

ideas, beliefs, values and norms; a person also develops his/her behaviour. This behaviour differentiates him/her from members of other societies, for example by learning the language of his/her society. The process of language learning is an important process in forming of culture. Moreover, language is widely regarded as human's most distinctive behavioural characteristic within the animal kingdom. At the same time it is widely acknowledged as a distinguishing characteristic for different cultures (Serpell, 1976). Scientific culture, for example, also has its own language (Fang, 2004).

In time of learning processes a person develops his/her knowledge of common sense. The knowledge of common sense is knowledge that he/she shares with other people of his/her society in the obviously routines of daily life (Berger and Luckmann, 1974). For example, animal scientists studied at the university with other people with the same interests. They are mostly trained by other animal scientists. After a while students think, proceed and talk like other animal scientists. The animal scientific culture has been originated. On the other side Somali pastoralists also develop their knowledge of common sense, which they share with the rest of their society. This knowledge of common sense could differ with the knowledge of common sense of the animal scientists. Nevertheless both cultures have their natural way of thinking and behaving, which is their reality of daily life (Berger and Luckmann, 1974). Nonetheless, how strong the influence of culture on the individual through learning process might be, human behaviour is not solely determined by values, norms and roles they have learned. There will always be individual differences between people (Jager *et al.*, 2004).

Often traditional culture is seen as an irrational impediment that is 100% per cent different from western cultures (Douglas, 2004). However Douglas (2004) describes a more nuanced view of traditional culture. Douglas (2004) developed the cultural theory for dealing with different groups in a developing culture. In the cultural theory there are two types of culture: the culture of hierarchy and the culture of fatalism see figure 2.1. In the culture of the hierarchy important families have the power. They form the cultural coalition who runs the town (Douglas, 2004). These families have most of the time a traditional character and do not want to change the practices of daily life. In the culture of the fatalism, people think that the human cannot influence his or her fate. These individualists are open-minded and bring innovations to their town. They are open for new developments and solutions. However these two cultures need each other, but they disapprove and love to hate each other (Douglas, 2004).

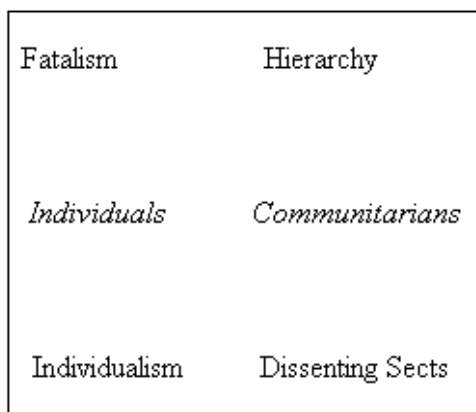


Figure 2.1: Two types of culture (Douglas, 2004)

Culture is dynamic and changes continuously. The environment has a large impact on the routines of a culture, like dry/rain seasons. When there is a problem situation in a society, sometimes the routine of daily life needs to be changed structurally (Berger and Luckmann, 1974). In specific cases scientists could help to solve the problems. For example when there are diseases among livestock animal scientists could help societies with treating the diseases. Mastitis could be such kind of problem disease.

However, animal scientists need to take the local culture into account. They need to show respect for traditional knowledge, because certain people in society know a lot about traditional medicines and treatments. Local people will first go with their sick animal to this person, before seeking help from outside (Köhler-Rollefson *et al.*, 2001). So when scientists want to cooperate with a developing culture they have to show respect and as Douglas (2004) stated they have keep in mind the different groups within a culture.

Another problem is that there is a gap between science and putting knowledge into practice, also called technology. The gap existed when science retreat themselves from rural area to the university (Schakel, 1989). Consequently, the formulation of scientific purposes became more a scientific activity and the purposes are lesser applicable in rural areas. So a lot of technological designs are of inferior quality, because of the distance with the reality (Schakel, 1989). Nowadays, animal scientists still have the same problem. To tide over the gap, scientists could use the theory of culture, because then they could find out how the information flow within a culture goes and what the best way is (hierarchy or fatalism) to transfer specific knowledge.

As stated in the Introduction, culture and animal welfare are complicated subjects, because these subjects are not neutral concepts. Secondly the relation of people towards livestock

differs culturally and regionally. Thirdly the views of how people look towards animal welfare can be different in one culture. Because of the different kind of opinions and statements about this concept, the question: ‘What is animal welfare?’ is elaborated in the next section.

## 2.2 What is animal welfare?

Animal welfare is the attitude of humans towards non-human animals (Serpell (2004)). Serpell (2004) modelled the attitude of humans towards non-human animals into: *Affect* and *Utility*. ‘Affect’ represents people’s affective and/or emotional responses to animals, and ‘Utility’ represents people’s perceptions of animals’ instrumental value (Serpell, 2004). The strengths of Affect and Utility are independent of each other, but the effects of Affect and Utility on the attitudes of humans are not independent (Serpell, 2004). Affect and Utility comes frequently in conflict with each other, which explain the difficulties in the relationships between humans and non-human animals.

Animal welfare is a complex subject, which starts by the problem that an animal cannot talk or communicate in ways humans understand. Therefore people give their own interpretation to animal welfare and additionally those people have different norms and values. For example to wean a camel calf of the milk Somali pastoralists place two sharpened sticks into the upper lip of the calf to inflict pain to the udder of mother during suckling. The female camel (dam) will then defend herself by pushing the calf away when it wants to suckle (Bekele *et al.*, 2002), see figure 2.2. For pastoralists this is a normal manner to wean a calf of the milk. However, in western cultures people would condemn this type of bad animal handling.



Figure 2.2: Camel calf with Acacia thorns in his upper lips (Schwartz and Dioli, 1992)

So culture plays an important role in the relationship between humans and animals. A human grew up in a society with their specific cultural values and the person adopts the ideas, beliefs, values and norms with the practices of daily life (Berger and Luckmann, 1974). These include ideas, beliefs, values and norms about relationships with animals. So animals, both specifically and as a group, are encumbered by quantities of cultural and symbolic baggage that greatly influence how people regard them and treat them (Serpell, 2004) For example, the relationship between a dog and a human is very diverging in several cultures. In some parts of China people eats dogs; in Moldova the dogs live on the street and people throw stones at them to keep them away, whereas in the Netherlands a lot of dogs sleep in the same bed as their owner.

So in context of culture there is a specific manifestation of human-non-human interaction. Herewith a typical view/opinion of humans about animals originates. In general these views can be subdivided into four world-views. As described by Fraser (2008) every world-view includes a specific way of handling animals. The four world-views are: Pastoralism, Agrarianism, Romanticism and Industrialism. Table 1.1 shows the four world-views including a short description. Table 1.1 is based on Fraser (2008, p. 60).

*Table 1.1: world-views and their ideology*

<i>World-view</i>	<i>Influenced by</i>	<i>Ideology for animal welfare</i>
Pastoralism	The Bible	- Animals are legitimate possessions which people are entitled to use in appropriate ways, but people have to provide the care that animals need.
Agrarianism	Traditional rural life	- Animal's life is not a life of ease or pleasure, but it is wholesome because it is lived in harmony with nature and the cycles of rural living
Romanticism	Rationalism	- Animals are fellow beings, capable of suffering and often degraded by constrains and artificiality of modern human society.
Industrialism	Neo-liberal	- Animals are part of an efficient production system. With the rational application of science and technology animals can become healthier and more productive.

The preference people have for a certain world view depends on the environment and culture where they grew up. For example, when a person grew up on a farm it is most likely that this person will have an agrarian-view. However, the worldviews are not mutually exclusive, but there is an overlap between the worldviews. So it is very likely that people hold more than one world-view. For example, when a person grew up on a farm and studied Animal Sciences, this person might hold an agrarian-view interwoven with an industrial-view.

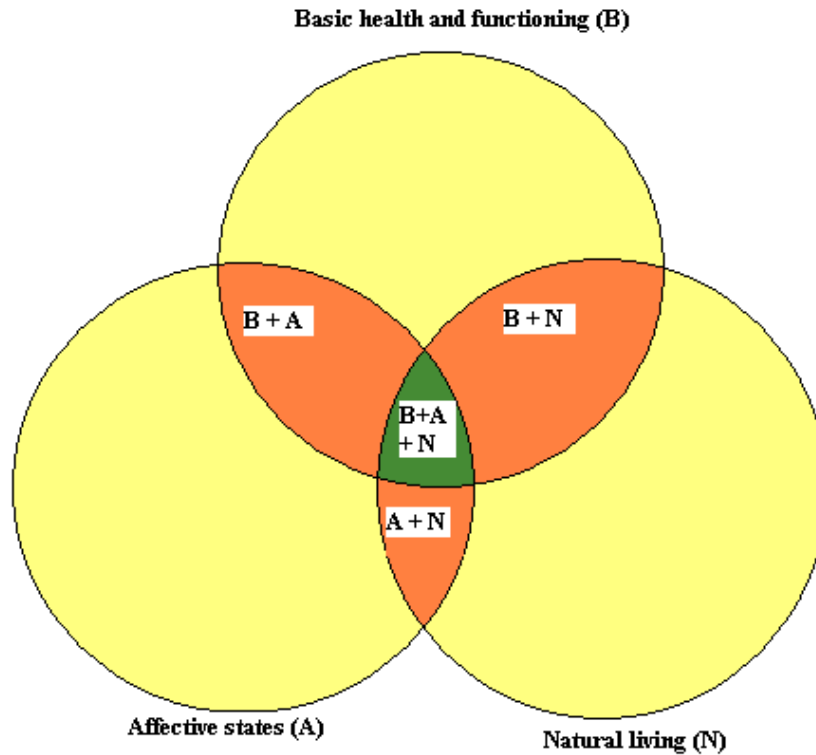
Nonetheless, knowledge also influenced the world view of western societies. Through the industrialisation in West-Europe, individualism and rationalism became a dominant way of thinking in the western societies. Herewith science became an important source of belief and religions and mythology went to the background (Fraser, 2008). Consequently, the world view industrialism got more followers. Even now knowledge influence world views, for example when a person who grew up in the city with sweet pets and later on that person will start to study Animal Sciences. First he/she will have a more romanticism view, but later on, after obtaining more knowledge he/she will get a more industrial view.

So the four world views are about the relation between a human and an animal and in which way humans handle animals. The four world views are not about how people think about animal welfare! Through the variation of people and cultures there are many different opinions about the basic question: ‘what is a good life for animals?’ Fraser (2008) subdivided these different opinions in three criteria, see table 1.2.

*Table 1.2: Three general criteria for good animal welfare*

<i>Criteria</i>	<i>Good Welfare is...</i>
Basic health and functioning	when an animal is healthy
Affective states	when an animal is happy and has a good mental status
Natural living	when an animal can express natural behaviour

So each criterion has an own definition of good animal welfare. However, these three criteria can overlap each other. When they overlap each other imperfectly, seven other possible areas are created for good welfare, see figure 2.3 (Fraser, 2008, p. 230).



*Figure 2.3: Venn diagram showing three general criteria (yellow) of animal welfare and seven possible areas (yellow, orange, green).*

So sometimes the criteria are conflicting. For example, when cattle live in a nature reserve some people think that the cattle have a good life, because they have a natural living. The cattle are also happy, because they can do what they want. So they have a good life according to two criteria. Then there is severe winter and a lot of cattle die because there is too less food. Then people start feeding them, because their opinion is that the cattle do not have a good life without extra food. So they want that the cattle have a good basic health and functioning. This result in an overlap between the three criteria: ‘basic health and functioning’, ‘natural living’ and ‘affective states’. So now good life is in the middle of the three circles (green area). Another example is pigs that live in a barn. The farmer thinks that the pigs have a good life when the pigs are healthy and are functioning well. However, a person from an animal protection organisation thinks that the barn is too crowded with pigs. So the pigs are not happy and therefore their mental status is also bad, but when the farmer put toys in boxes; the pigs can play and are happy again. So also here there is an overlap between criteria, namely ‘basic health and functioning’ and ‘affective states’.

World views are related with the criteria of good animal welfare. This makes how people treat animals in a way they think what is good welfare. It is important to use the world-view, because the views are part of the western and local culture. The world view approach and criteria of good animal welfare are used by studying the attitudes of animal scientists and Somali pastoralists on camel welfare in relation to the disease mastitis.

### *2.3 Definition of problem*

The aim of this research is to compare the culture of animal scientists with the culture of Somali pastoralists in Ethiopia in case of camel welfare. The research therefore addresses the following research questions:

- 1) How can the animal scientific culture be defined in relation to animal welfare?
- 2) How can the Somali pastoral culture be defined in relation to animal welfare?
- 3) What are the similarities and/or differences between the two cultures in relation to animal welfare?



### **3. Animal Scientific culture**

The animal scientific culture is constructed by animal scientists on the basis of their common ground and interests in animal sciences. As such, animal scientific culture is not so much based on ethnic identities or traditional cultural societies, but can be considered as a global culture (Hodges, 2006; Hodges, 2004). Although, an animal scientist from the Netherlands may act differently in his daily manner in comparison with an animal scientist from Ethiopia, when the two animal scientists work together on an agricultural problem, they share the common scientific culture (Hodges, 2004). In this chapter I describe the development of the animal scientific culture and the key characteristics of the animal scientific culture.

#### *3.1 The development of Animal Scientific culture through decennia*

The last two age's science played a major role in Western culture, in the sense that the importance of religion decreased and the importance to prove everything with facts increased. Growing human interest in (natural) sciences emphasized the importance of rationalization in which any form of animal mythology was abandoned. Consequently, the western culture adopted a purely scientific understanding of animals and purely rational conclusions about how animals should be treated (Fraser, 2008).

In this period Animal Sciences became important by doing research on how to treat an animal properly. After all, an animal, which is treated well, is healthier and more productive (Freed and Freed, 1972). The researches were focused on understanding animals correctly. These researches were realized by observing animal behavior also called ethology and studying the physiology of different kind of animals (Fraser, 2008). After the Second World War the mission of governments changed. In the Netherlands, for example, the government aimed at cheap and abundant food so that famine was banished forever (Frouws and Leroy, 2003). The provocation of animal scientists became to create a higher productivity of animals. Efficient breeding and giving animals the perfect nutrition was one of the solutions to reach this goal. So automatically Animal Sciences extended herself to different fields of study. Animal Sciences grew into a study in which different fields of study are present, like breeding, genetics, ethology, nutrition etc.

Animal Scientific researches characterize itself by rationalism. With rationalism scientists' examine and judge everything what the human is given in experience with using reasoning.

So animal scientists try to find reasons and arguments why things works as it works and with these reasons and arguments they try to improve current situations and systems. However, this also means that animal scientists have a rational perspective on (farm) animals. Consequently farm animals became a production-unit which is part of an intensified animal production system. The rational perspective on livestock could also be a cause that a lot of animal scientists have an industrialism world-view, see section 3.2.

Now rationalism sounds a bit negative in case of livestock, but rationalism take cares that correct scientific conclusions are made about subjects that are also relevant in, for example public debates (Fraser, 2008). So another important job of animal scientists is that they have an active role in debates around ethics, for example in case of animal welfare. In their research to animal welfare they need to keep in touch with the social debate otherwise their research would be irrelevant (Fraser, 2008). After all, when the meaning of animal welfare is different in daily language, public cannot use the scientific understanding of what is good for the animals themselves anymore (Fraser, 2008). When that happens there would be a waste of time, money and knowledge, which would be a shame.

### 3.2 *Animal Scientific culture: objectives and performing*

Science is a form of culture with its own creeds, language, material practices, perceptions, theories and beliefs (Roth and Lawless, 2002). Like in every scientific field, animal scientific field distinguish itself with its scientific language, - behavior and - objectives. An animal scientific student learns to write, think and proceed as an animal scientist. The student follows his/her learning processes during practices of daily student life by: reading articles, doing practical's, writing essays and following animal scientific related courses. At the end of his/her study the student has a natural way of animal scientific thinking and it becomes his/her reality of daily life at the university and in his/her future field of working. So Animal Sciences starts to become the reality of daily life in the fields of study of the animal scientist. However Animal Sciences may not become the reality of daily life in daily (private) situations. In the sections below I discuss the objectives and the way of performing objectives of the animal scientific culture.

Every field of study has different objectives on which specialists focus. An objective is a goal that specialists want to reach in a particular time. For example, breeders can have the objective that the Holstein-Friesian cattle have to increase the milk-average with 10% in ten

years. An objective differs from time to time. For example, the Holstein-Friesian breeders can change their objective from higher milk productivity to a higher fertility-rate.

Animal scientist Hodges describes the objectives of animal scientists in several papers. In article 'Animals and values in society' Hodges (1999) argues that the objectives of animal scientists are focused on profit, reduced unit costs, and the desire to make more money this year than last year. The other side of this focus is that subjects like, longstanding practices of sustainable production, care of animals, and good husbandry of the environment are neglected. Due to the fact that livestock producers started to think as a business person who needs to succeed (Hodges, 1999).

Actually Hodges is saying that the objective of animal scientists is animal productivity, i.e. to produce as efficiently as possible at low costs and high income. Animal scientists are therefore challenging the boundaries of animal production systems (Hodges, 2006). For example by breeding cows with extremely high milk production. Animal sciences may develop new technologies to increase animal production, but in the end it is the farmer who has to put new technologies into practice. As such, science and technologies changed the way of farming from living with animals and taking care of animals into a business with animals as economic products (Hodges, 1999).

The arguments of Hodges are made ten years ago and the objectives are changed over the last decades. Subjects like sustainable animal production systems and animal welfare are really hot items at the moment. Productivity is still an important objective; however, the view of Hodges is rather general, because not all animal scientists have productivity as their main objectives. Animal scientists can also have other objectives, like sustainability and biodiversity. Instead of productivity, nature is the main focus with subjects like sustainability and biodiversity. Besides of personal objectives of a scientist, there is also another factor which plays a significant role; the employer for which the scientist works. Some scientists want to maximise the profit of their employer or have to maximise the profit without taking their personal objectives in account (response Bertoni on Hodges 2004).

The way how an animal scientist reaches his/her objective is depending on their world view and criteria of animal welfare. As mentioned in chapter 3 "*the preference people have for a certain world view depends on environment and culture*". The world view of an animal scientist who grew up in a city might be different then the world view of an animal scientist who grew up on a farm. So there is variation between individuals in case of world views.

These variations in world views could have an impact on how they perform their objectives in the way of handling animals. The criteria of animal welfare could push the performance of an objective in a certain direction. For example when the criteria of good welfare is that an animal is healthy, then the focus of the performance of an objective would lie on how to get an animal as healthy as possible. The other criteria might be well enough correlated with animal welfare to serve as useful indicators in some circumstances, but the one true criterion would trump the others whenever disagreement, between animal scientists, arises (Fraser, 2008).

The reaction of animal scientists on animal welfare is diverse. The reactions of animal scientists on animal welfare will be different in case of ethnic identity or traditional rituals from his or her original society (Hodges, 2006; Hodges, 2004). Because of the different cultures animal scientist can also behave different in the scientific world. So individually there are differences.

Heleski (2004) did a research among an animal scientific faculty in England. The attitudes of the faculty members towards animal welfare were various. For example, 90% of animal scientists support the general principles of animal welfare (Heleski *et al.*, 2004). These general principals are the five freedoms. However, only 40% of the animal scientists were willing to pay slightly more for products coming from facilities that are enhancing welfare beyond industry-common levels (Heleski *et al.*, 2004). So, even though a large majority (90%) confirms the importance of animal welfare, only 40% says to express this concern through their consumer behaviour. So the values and beliefs of animal scientists in relation to consumer behaviour are different.

Heleski (2004) also asked animal scientists to rank animal welfare, sustainable agriculture, food safety and environmental issues in order of importance. In general, animal scientists ranked the importance of animal welfare and sustainable agriculture much lower in comparison with food safety and environmental issue (Heleski *et al.* 2004). It is possible that their objective and herewith their world view and animal welfare criteria played a role in this ranking. Their world view could be industrialism in which animals are part of an efficient production system. Other parts of an efficient production system are ecology and economics, which were in general more important for these animal scientists.

In short, animal welfare is playing a significant role in the animal scientific culture. However, the degree of practising animal welfare is depending on the world view and criteria of animal

welfare of that particular animal scientific person. Besides of world view and criteria of animal welfare, animal scientists have several techniques to investigate animal welfare. Animal scientists need these techniques to have evidence to falsify if the welfare of an animal is harmed or not, also called evidence-based-falsification. The techniques to investigate animal welfare are working with different kind of environmental- and animal-based indicators (Boer and Bokkers, 2008). With these indicators animal scientists measure the level of animal welfare in a specific situation. The Animal Needs Index (ANI) is an example of a set of indicators. The ANI, (German: “Tiergerechtheitsindex” TGI) was developed to be used primarily at farm level as an instrument for assessing and grading livestock housing with respect to the well-being of the animals (Bartussek, 1999).

In my research the disease mastitis is used to make a comparison between the animal scientific culture and the Somali pastoral culture in case of camel welfare. Mastitis can be subdivided into two types: clinical mastitis and sub-clinical mastitis. Animal scientists did a lot of research about how they can falsify mastitis at the udders of dairy livestock. In case of clinical mastitis it is easy to detect if it is present or not, because it is recognisable by examination of the udder. Symptoms of clinical mastitis are swelling of the udder, pain and redness. Also the milk is changing colour and clots are present.

However, the symptoms of sub-clinical mastitis are not possible to see from the outside of the udder. Hence detection of sub-clinical mastitis is difficult and different kinds of tests are needed to falsify sub-clinical mastitis. To detect sub-clinical mastitis researchers and veterinarians are trying to find indicators of inflammation in the milk by doing mastitis-tests. There are still no specific sub-clinical mastitis tests for camels, but various tests which are developed for cattle with mastitis (like the California mastitis test) can be used. Yet there are problems with interpreting the results of these tests, because the criterion of cell levels and the physiological variations between the multiracial camels are not established.

To what extent mastitis is present by a camel is classified by: acute mastitis and chronic mastitis. Acute mastitis can be recognised by changing in milk colour, presence of pus, red blood cells, flaks and clots. Chronic mastitis is recognised by pathological changes of the udder, like hardening of the udder, blockage of the teats, atrophy or fibrosis and abscess formation, see figure 3.1. (Abera *et al.*, 2010; Abdurahman, 2006) Acute – and chronic mastitis is not the same as clinical and subclinical mastitis. Acute mastitis is a suddenly

inflammation with the previously described symptoms and chronic mastitis is a continual inflammation which, in general, exist when acute mastitis is not treated.



*Figure 3.1: Female camel with chronic mastitis associated with dilated and tortious milk vein (Ramadan et al., 1987)*

## 4. Somali pastoral culture in Ethiopia

In this chapter the Somali pastoral culture is elaborated. Somali pastoralists live in the south-east of Ethiopia, nearby the border of Somalia, see figure 4.1. Camels play an important role in the Somali pastoral culture. The disease mastitis is a general problem among camels, but there is still no solution against this disease. Abera *et al.* (2010) claimed that the traditional treatments by herders against mastitis are also ineffective, however, the reference he used (Ramadan *et al.*, 1987) did not talk about traditional treatments. This makes the ‘camel welfare – mastitis’ case even more interesting in relation to the research question: How can the Somali pastoral culture be defined in relation to animal welfare? Do the pastoralists care about the welfare of their camels? And do they treat diseases or not? First geographic and historical information about Ethiopia and the Somali pastoralists is given. Afterwards the social function of the camels and camel welfare in relation to Somali pastoralists are explained.

### 4.1 Geographic information about Ethiopia

The Federal Democratic Republic of Ethiopia (FDRE) is a country with a long history. The ancestors of modern humans, so-called *Homo sapiens* came from Ethiopia (Asfaw, 1999). After years the *Homo sapiens* spread out to occupy much of Eurasia (Petraglia *et al.*, 2010). At present, there are a lot of clans in Ethiopia: there are more than 80 different kinds of ethnic groups with their own language, culture, custom and traditions (Teklehaimanot, 2002). The main languages in Ethiopia are Amharic and English (Minbuza, 2010). In reference to religions 45% of the Ethiopian population is Islamic and 35% is Ethiopic Orthodox. In 2008, the population number of Ethiopia was 72.5 million people.

Ethiopia has a land surface of 1,127,127 km<sup>2</sup>, which equals 27 times the land surface of the Netherlands (Minbuza, 2010). Because of the fact that Ethiopia is a large country I focus my research on the pastoralists in the ‘Somali National Regional State’. Somali State is chosen because a lot of research for mastitis by camels is done here. The ‘Somali National Regional State’ is situated in the south-east of Ethiopia at the border with Somalia, see figure 4.1.



Figure 4.1: Major camel pastoralist groups in eastern Africa (Köhler-Rollefson et al., 2001)

#### 4.2 History in context with modern lifestyle of pastoralists in Somali Regional State

From 1974 until 2000 Ethiopia had an alternation of political instability, war, famine and economic decline (Lindstrom and Berhanu, 1999; Munro-Hay, 2002). The decennia of instability and insecurity cause a run of refugees between Ethiopia and Somalia. In the 80's and 90's the war was concentrated in Somalia. Due to the expansive violence in Somalia a lot of Ethiopian Somali and Somalis fled (back) to Ethiopia. These refugees and returnees settled either in their home villages or in refugee's camps (Sugule and Walker, 1998).

The run of refugees between Ethiopia and Somalia had a big impact on the lifestyle of the pastoralists in the Somali Region (Sugule and Walker, 1998). However, the run of refugees



was not the only factor which changed the life of pastoralists in Ethiopia. The increase in the number of water points and growth in area of cultivated land are also important factors. On the basis of the article of Sugule and Walker (1998) I summarise the impact of these factors:

*When the refugees came back to Ethiopia they settled almost always in an area nearby a water point. These areas were cultivated for crops and the forest was used as firewood. Also parts of grassland were enclosed for permanent grazing of livestock. The villages around the water points started to grow and more water points were made. However, there was no proper planning for the water points, which resulted in a proliferation of water points.*

*Normally the pastoralists and agro-pastoralists needed to travel in the wet and dry seasons to search water, however, with the proliferation of water points a lot of areas could be grazed in the wet season as well as in the dry season. This resulted in circumstances in which pastoralists and agro-pastoralists did not have travel anymore. They could settle with their livestock nearby water points. However, additional problems became overgrazing of areas and decrease in availability of roughage for livestock. This had serious consequences on the health of livestock, for example malnutrition and an increase in livestock diseases.*

*Since the 70's agricultural production increased. Especially in the high rainfall areas in the north of Somali State agricultural production increased. Some clans turned from a pastoral lifestyle into an agricultural lifestyle. Beside the change of lifestyles of clans many refugees also started to cultivate land as they lacked access to livestock. Together with this they also enclosed grasslands for fodder for their livestock. Herewith, the access to open areas became scanty for the traditional pastoralists. Likewise the traditional pastoralists needed to change their customs. (Sugule and Walker, 1998)*

#### 4.3 Social roles and functions of camels

The pastoralists in the Somali state have herding combinations of camels, cattle, goats and sheep. The agro-pastoralists in the North of the Somali state have in addition to crop production also a small herd of animals (Sugule and Walker, 1998). I will concentrate on the social role of camels by pastoralists.

Camels have the same value as cattle, because both animals are seen as fundamental sources for the family. When a camel disappeared because of environmental circumstances, like drought and other environmental shocks, it can have short- and long-terms effects on the family. Examples of short terms effects are increased poverty and deprivation (Carter *et al.*,

2007). An example of a long term effect is a shortage of money with consequences like children who can not go to school anymore.

In dry areas camels are multifunctional animals. Besides the fact that camels are financial reserves and investments; camels are also a source of milk, meat, skin and draft power. Camels also play a role in social security (Abera *et al.*, 2010; Bekele *et al.*, 2002; Tefera and Gebreah, 2001). Mainly, camel meat is appreciated by Muslims (Bekele *et al.*, 2002). So in the east of Ethiopia, where a lot of Muslims live, there is a big market for camel meat. However, camels are not efficient for meat production, because of their bad reproductive performances (Tefera and Gebreah, 2001). On the other hand, traditionally camel milk is not sold commercially. Nonetheless pastoralists started to sell camel milk, because of recurrent droughts and high losses of livestock. The price of camel milk is higher than the price of cow milk (Tefera and Gebreah, 2001).

Camels are not selected for milk production or quality of the udder, because it is a multifunctional animal (Abdurahman, 2006; Abera *et al.*, 2010). Camel milk is special in comparison with other kinds of milk, namely camel milk is very good to drink in the deserts. It is even an essential part of the daily diet of pastoralists (Abdurahman, 2006). Camel milk is nutritious (high concentration of vitamin C), thirst quenching, easily digestible and can be preserved much longer in comparison with other kinds of milk (Mohammed, 1993). Camel milk yields also profit in the fact that camels have a long lactation period and they maintain milk production throughout the long dry spells, when milk production of other livestock is low (Bekele *et al.*, 2002; Abdurahman, 2006).

Camels are also representing wealth and prestige. Camels belong to clansmen who are recognised as members of larger corporate units and as such their ownership rights are restricted: camels belong to men, not women, with group rights prevailing over individual ones (Nori, 2010). According to the fact that camels belong to men the social role of taking care about a camel also belongs to men. For women it is even forbidden to milk a camel (Bekele *et al.*, 2002). This role belongs to boys and men (see figure 4.2).



*Figure 4.2: Somali boy milking camel (<http://www.ednahospital.org>)*

Regarding to domestic affairs camels play a decisive role: the more camels a pastoralist has, the more his opinion within the council will be relevant, because the high number of camels shows that the pastoralist has about good workmanships at one's disposal (Nori, 2010). Camels are also used as compensation during social conflicts, heritage, bride wealth, blood compensation and restocking. At the side of the social functions of the camels, the flow of camels between herds is also relevant for increasing the genetic diversity within the herds (Nori, 2010).

Camels are also used as draught animals. Especially in desert areas camels play a significant role, because there are no other possibilities of transportation possible (Bekele *et al.*, 2002). During evolution the camel adapted himself to the dry and scanty environment. The uniqueness of a camel is the fact that a camel can live 15 to 30 days without water. Formerly during the dry seasons the pastoralist started to ramble and the families split themselves up. Herewith, pastoralists tried to get enough roughage for their livestock to survive the dry season. Because of the fact that a camel can survive without water for such a long time, boys and men travelled with the camels further away from the water points. The women just stay nearby a water point with the rest of the livestock. Since the uncontrolled building of water points these ramble patterns disappeared and with that also a part of the traditional culture disappeared. (Sugule and Walker, 1998)

#### 4.4 Camel welfare and pastoralists

The camel is an investment and an important mobile (surviving) source for pastoralists. With it the health of the camel is extremely important for the pastoralists. To illustrate the importance of animal welfare for pastoralists I want to focus on a general disease among camels, namely mastitis. Mastitis is an inflammation of the mammary gland (udder) (Abdurahman, 2006). Mastitis is a disease that not only occurs by camels; other kind of dairy livestock can also get mastitis, like cattle and sheep. The prevalence of mastitis by camels is significantly affected by tick infestations, udder lesions, increased age and parity of the animals (Abera *et al.*, 2010; Abdurahman 2006)

Mastitis has impact on the welfare of a camel, because it causes swelling and pain to the udder (Abera *et al.*, 2010). However, mastitis also has impact on the health of pastoralists, because milk of an infected animal is not drinkable anymore (Abera *et al.*, 2010). Veterinarians try to treat mastitis and animal scientists try to prevent camels for mastitis. This makes mastitis a perfect case for making a comparison between the animal scientific culture and pastoral culture about camel welfare.

First the traditional management of pastoralists is elaborated. Similar to the dairy farmers in western cultures, every pastoralist has his own way of managing his camels. Based on researches of Bekele *et al.* (2002), Abdurahman (2006), Tefera and Gebreah (2001) a general view of the traditional management of camels in the eastern of Ethiopia is given. The emphasis of the traditional management is put on the lactation of camels.

Bekele *et al.* (2002) described the Somali pastoral traditional management in his report “Milk production performance of the one humped camel under pastoral management in semi-arid eastern Ethiopia”. A summarise about theses pastoral milk practices is made.

*“In the early morning the livestock leaves the village to travel to the hilly areas for grazing. In the night the camels are kept in a corral made up of thorny woody branches. In the corral there is no separated housing for females or males and all different kind of ages are mixed up, except the suckling camel calves. Those calves are placed separately. The only additional feed that camels get is salt (once a month). The amount of water that camels get is depending on the season. During the wet season camels can get enough water out of the browsing plants, but in the dry season camels get water once a week.”* (Bekele *et al.*, 2002, p. 38-39)

Lactation in pastoralist herds depends on several factors, like husbandry practices, heredity, season, nutrition and the demand of milk. Milk volume depends on farming practice, such as milking frequency and suckling (Tefera and Gerbeah, 2001). In spite of the fact that lactation is dependent on human acting and seasons, the camel calf also plays a significant role in milking female camels (dams). The dissimilarity between a cattle and a camel is that camels lack a milk cistern. So camels do not store milk in the udder and consequently camels have shorter duration of milk let down (Abdurahman, 2006). The role of camel calves is to stimulate the milk let down by suckling the udder. Straightaway the calf is taken off the dam and two men, at each side, are milking the dam. After milking the calf is allowed to drink the rest of the milk out of the udder (Bekele *et al.*, 2002; Abdurahman, 2006). The lactation length of a dam is 9-18 months (Tefera and Gerbeah, 2001). However the weaning age of a calf is between 12 to 18 months. The weaning age of a calf depends on when the dam become pregnant again. To wean a calf of the milk, two sharpened sticks are placed into the upper lip of a calf to inflict pain to the udder during suckling. The dam will then defend herself by pushing the calf away when it wants to suckle (Bekele *et al.*, 2002).

During milking practices and other daily practices a camel can be infected with mastitis. Mastitis a general disease, however, I could not find traditional methods of pastoralists to prevent camels for mastitis, neither methods to heal camels with mastitis. Abera *et al.* (2010) stated that scientist Ramadan (1987) proved that the traditional treatments attempted by herders for mastitis are usually ineffective. However, the article of Ramadan (1987) was not about traditional treatments. The traditional treatments are even not mentioned in his article.

Nevertheless the impact of mastitis on the pastoralists is very clear and noticeable at several levels. Firstly mastitis has a big impact on the physical condition of pastoralists, because mastitis affects food security: the inflammation reduces the milk production of a camel and it induces decreased milk quality. Secondly, mastitis has an economic impact on the pastoral families. Because of decreased milk production pastoralists can sell less milk (Abdurahman, 2006, Abera *et al.*, 2010). So mastitis is a disease which cannot be ignored by pastoralists.

Besides the fact that pastoralists experience the serious consequences of mastitis, the welfare of the camels is also in danger. For example: the dam will have pain to her udder and a calf can even die when the dam has blocked teats (caused by chronic mastitis). But how do the pastoralists think about the welfare of the camel? According to Fraser and his four world-views about animal welfare, a pastoralist will have a pastoralism view. He sees his camels as

legitimate possessions which he can use in appropriate ways and he want to provide the care that a camel needs. So the pastoralist takes care of his camels and according to that he takes care about the welfare of his camel as far as he is possible

Finally it is important to keep in mind that the lives of pastoralists are inextricably linked with their livestock and the pastoralists developed knowledge in animal husbandry and diseases (Abdurahman and Dirie, 2003). Abdurahman and Dirie (2003) did interviews among Somali pastoralists about little known diseases of camels. Most of the time the pastoralists had their own traditional methods to treat camels against those diseases. Somali herders are renowned for their use of ethno-veterinary knowledge in matters of livestock health and husbandry (Abdurahman and Dirie, 2003). So maybe the Somali pastoralists have their own treatment against mastitis, but did the scientists not recognized it or they did not asked it.

## 5. Analysis

The analysis consists of a comparison between the way animal scientists and pastoralists define and deal with camel welfare in terms of mastitis. After the comparison conclusions and recommendations will be made in case of mutual understanding on the subject camel welfare.

### 5.1 *Culture and problems*

Every society or culture has to deal with problems in different domains, like social, economic, technical etc. These problems are most of the time a motive to change practices in daily life. Sometimes new solutions are discovered to solve a problem, which brings about changes in society. However, the question is: when is a problem a problem? Who decide what a problem is and how it will be defined? These are ethical questions. Every culture and every person has another opinion. As consequence, that there are many perspectives on one problem. So there are more solutions for one problem.

To go a step further why are there problems? Are there problems because of the fact that different cultures and different perspectives meet each other through for example media? When this is the case, why and how do these problems emerge and manifest? Mastitis is a problem because of the fact that science said that it is a problem. On the other hand was mastitis also a problem when science did not said that it was a problem? The pull back of science from daily practice of agriculture to the university cause more happenings to be a problem.

Animal welfare is also a problem in western society. Western society and its members respond different to animal welfare problems, but structural changes were necessary. For example farmers changed their barns to provide better animal welfare. How does the animal scientific culture and pastoral culture react to the 'animal welfare' problem? In the animal scientific culture the ideas around animal welfare are not new, but it takes many years for the animal scientific culture was adapted to these ideas. Even now it is difficult to teach fresh animal scientists about animal welfare. As well as that in the pastoral culture the specific word 'animal welfare' is probably not even used literally, because animal welfare is a typical West- European subject (problem). However, this does not mean that pastoralists do not care about animal welfare.

## 5.2 Culture, camel welfare, economics and mastitis

In the Western dairy industry mastitis is a very common disease. Years of research passed by and still there is no optimal solution to heal or to prevent mastitis. It seems also not possible that there will ever be found one single all-embracing vaccine that will suppress mastitis, because of the multiplicity of types of infection that are involved (Blowey and Edmondson, 2010). In 2009, 40-50% of dairy cattle in the United Kingdom were infected by mastitis each year (Blowey and Edmondson, 2010). In 1997, Kossaibati and Esslemont did a research to the costs of production diseases in the dairy herds in England. From their research could be concluded that mastitis seized 38% of the total direct costs of the common production diseases. So mastitis is a disease which has a large economic impact in the Western world.

In Ethiopia, 42% of the animals have no sound teats for milk production as cause of mastitis (Abera *et al.*, 2010). The percentages of camels with subclinical mastitis vary between 20.7-47.3 per cent (Abera *et al.*, 2010). These percentages are similar to the percentages cattle dairy industry in England. This similarity is interesting, because in England dairy farms are specialised in milking practices, whereas in Ethiopia the animals have more roles and functions.

Camels are multifunctional animals and they are not selected for milk production (Abdurahman, 2006; Abera *et al.*, 2010). Milking practices are just a part of the total agricultural system. Therefore the milking practices are not optimal in terms of getting a maximal amount of milk, in comparison with western milking practices. However, many animal scientists are saying that poor management and unhygienic milking practices are prevalent in the traditional husbandry systems (Abdurahman, 2006; Abera *et al.*, 2010). But is it fair to say that pastoralists have a poor management, when the scientists are only looking at the milking practices?

To answer this question, I start with an example: At a dairy farm in western society the whole management is adjusted/ developed to have the highest milk production as possible. In this situation one could to say that the farmer has a poor management, when the farmer has a low productivity as cause of mastitis. Actually animal scientists are comparing the pastoral systems with different/ other norms, namely 'western' norms. To make a correct statement about management qualities of pastoralists, people have taken the total management of



pastoralists into account, in which milking practices are a subsystem. So functions in pastoral management system are frequently overlooked/ neglected.

In addition to management, mastitis can be caused by other organism, like ticks, bacteria, mycoplasma, yeasts, algae (Bradley, 2002). Hygiene during milking practices and a good health of the udder are important to prevent mastitis. Several articles stated that pastoralists do not have traditional methods to prevent camels for mastitis and that there is even no control on mastitis (Abera *et al.*, 2010; Abdurahman, 2006). Also in the descriptions about traditional management traditional techniques which can eventually prevent a camel for mastitis are not mentioned (Bekele *et al.* 2002). So one could question whether pastoralists actually care about the fact that a camel has mastitis and a diminished health?

Yes, pastoralists do care about the health of their camels and the fact that their camels have mastitis, but mastitis is not the only disease that affects the welfare of the camels in Ethiopia. There are other major diseases that concern the pastoralists and scientists much more (Abera *et al.*, 2010). So in contrast to western society and culture, mastitis in Ethiopia is not the disease with the *highest economic importance*. The investments of the pastoralists with as regard to camel health are therefore different.

That there are no scientific articles about traditional treatments against mastitis will not say that there are no traditional treatments. In book 'A field manual of camel diseases' modern treatments as well as traditional treatments against mastitis (and other camel diseases) are described, however, it is not clear from which pastoral group the traditional treatments are. The traditional treatments against mastitis are:

- Milk the camel as frequently as possible and remove all milk from the udder and throw this milk away
  - Rub an ointment such as sheep-wool fat or sheep-tail fat into the affected area
  - Apply an ointment made of *Sesbania sesban* or *Ajuga remota* mixed with butter or a fat made from sheep-tail or goat intestines.
  - Burn faeces in a pot and place the pot under the udder so that the udder starts sweating
- (Köhler-Rollefson *et al.*, 2001, p.189)

The choice of the pastoralist to use modern- or traditional treatment depends on several things, like kind of disease and condition of disease, availability of money, value animal etc. (Köhler-

Rollefson *et al.*, 2001). In comparison with pastoralists, animal scientists have less appropriate – and detailed knowledge about camels, because pastoralists grew up with camels (Bunge, 1983). They learned with the practices of daily life the knowledge of several generations. For example, many camel herders have a detailed knowledge of medicinal plants and how to use them to treat particular diseases (Köhler-Rollefson *et al.*, 2001). But these medicinal plants are not always that efficient, because sometimes it only treats the symptoms and not the cause of the disease (Köhler-Rollefson *et al.*, 2001). In this situation animal scientists have ‘better’ knowledge than the pastoralists, because animal scientists can use superior methods (like systematic experiments). Finally they can help to find and treat the cause of diseases, like mastitis (Bunge, 1983). So it is important that pastoralists and animal scientists work together to improve camel welfare by exchanging knowledge.

However where put the animal scientific culture and pastoral culture emphasis on in case of camel welfare? According to the world views of Fraser (2008), animal scientists (as one group) have predominantly an industrial world view. On the other hand pastoralists have predominantly a pastoral world view. This is one difference, between animal scientists and pastoralists. Is there also a difference in case of the three criteria of good life for animals?

Yes, starting with pastoralists. Animal welfare is a hot topic in western society, but a pastoralist does not think about the affective states of his camels. Maybe when a camel is restless he will check if his camel is sick or not. Pastoralists travel around in nature. So he does not worry about the fact that his camel can express his/her natural behaviour. So the emphasis of pastoralists lays on the criterion basic health and functioning. Animal scientists are mainly western orientated and therefore dependent on personal preference all three criteria could play a role. So as animal scientists it is important to realise that world view and criteria of good animal life is different in case of pastoralists.

In short, it is important that pastoralists and animal scientists cooperate, because a lot of misunderstanding in economic and social field can be averted. In case of mastitis pastoralists and animal scientists can cooperate to find out how to treat mastitis efficiently. So they can decide together what needs to be changed in case of milking practices. Herewith they can also consider the pros and cons of a treatment against each other in economic – and social field.

### 5.3 *Conservative and progressive characters*

As said in chapter 2.1 Douglas (2004) developed a strategy for dealing with different cultures/characters in a developing culture, so called theory of culture. In this theory there are two groups, namely conservative people (culture of the hierarchy) and progressive people (culture of the fatalism). Conservative people would like that everything stay the same and they do not want to change practices and routines of daily life. Progressive people are open-minded and are looking for new possibilities, developments and ideas to improve the practices and routines of daily life. However, these two kinds of people still need to work with each other and therefore they have to make compromises, because they approach problems differently.

The culture of the hierarchy and the culture of the fatalism are also recurring in the animal scientific culture and the Somali pastoral culture. In the animal scientific culture there are scientists who do not care about animal welfare, because it has not been a point of attention by animal scientific tradition. These animal scientists keep productivity as main focus point. However there are also animal scientists who are strongly engaged in animal welfare. In the pastoral culture there are pastoralists who still want to practice the traditional way of pastoralism, but there are also pastoral clans who started to cultivate land, like the Gababursi, Yabarre, Gerri-Jarso, Bartire and the Abaskul (Sugule and Walker, 1998).

Both cultures deals with hierarchy and fatalism, but they have to work together in case of animal welfare in developing countries. It is important for a scientist to know to which culture one grew up and was educated and with what culture one deals in his/her work. It is logical that an individualistic animal scientist who works together with an individualistic Ethiopian pastoralist will have fewer conflicts, than a communitarian animal scientist who works with a communitarian pastoralist. Why do two individualistic persons from two different cultures have fewer conflicts? This is because the two individualists are open-minded and they will adopt the ideas of the other person. They recognize each others values as different, but equally important. So self-reflection of an animal scientist is important to make projects in developing countries successful (Fraser, 2008; Hodges, 2006).

Another important aspect to make a project successful is to bridge the gap between knowledge and technology. An option could be to integrate the solutions for animal diseases to the routines of daily life. So in the beginning animal scientists need to discover what the

routines are and then adapt his/her solution for a problem to the routines. In case of mastitis, first discover what the milking practices are and the values of milk. After that try to find a solution how to treat mastitis, with making as few changes as possible in the routine of daily life.

#### *5.4 Example of participatory research*

In the Southern of Ethiopia organisation FARM (Food and Agricultural Research Management) Africa started a research method where farmers participated in scientific researches. This method is entitled Farmer Participatory Research (FPR) and it refers to the active involvement and participation of beneficiaries (farmers) and other stakeholders in the agricultural research process. An important aspect of the FPR is that farmers and researchers have dialogues with each other and that they collaborate as partners in the research process. So the farmer and the scientist are equal and they need to respect the knowledge of the other person. Actually by means of the dialogues the farmer and the scientist are sharing their knowledge of common sense (FARM Africa, 2001).

Both parties can benefit from participatory research. First scientists have to adjust and re-examine their own knowledge and attitudes towards farmers so see his knowledge and values as equally important. When a scientist shows his/her interests in the concepts of the farmers he/she will get more detailed technical information. With that scientists can adapt his original research-plan to make it more successful. Secondly, farmers also have to adjust their ideas too, because then a good cooperation can be started.

The Farmers Participatory Research could be a useful concept in case of mastitis by camels. Instead of allowing animal scientists to examine the camels for a few months and to give a judgement about the management of the pastoralist, both parties could share their knowledge and collaborate with each other to find the best solution against mastitis.

## **6. Conclusion**

It is important to realise when a problem emerge, how the problem is defined and who defined it, because this creates a certain direction in the way a problem is solved. When there is a problem situation and animal scientists would like to solve that typical problem, however, they need to integrate more. Herewith animal scientists need to find a solution that fits into that particular situation or culture. So it is not good to come with a solution and expect that the situation or culture will adapt to the solution.

There are more perspectives about how a camel should be treated for mastitis. As consequence, that there are more solutions to heal camels. Empirical knowledge did not exclude that traditional treatments against mastitis did not work. So it is impossible to say that traditional treatments are nonsense. Actually it is very typical that science does not use empirical knowledge. This literature study showed that empirical knowledge is very valuable. So science needs to find a way to make empirical knowledge useful for researches.

## **Recommendations for further research**

This paper offers possibilities for further research. To delineate my research some social aspects are not taken into account, like the role of gender. Are some camel welfare problems not defined as a problem, because of the fact that men takes care of the camel? Another social aspect is the social structure. Is it possible to introduce modern treatments for diseases or is this almost impossible because of social structure?

Empirical knowledge showed that traditional treatments are also working. It would be very interesting to do research about how livestock diseases are called in traditional way and how these diseases are traditionally treated (and if the treatments work). This would broaden the treatment possibilities of veterinarians and increase camel welfare. After all it is necessary to improve the communication between animal scientists and pastoralists. As consequence that problems are defined correctly and potential solutions fit in the routines of daily life.

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