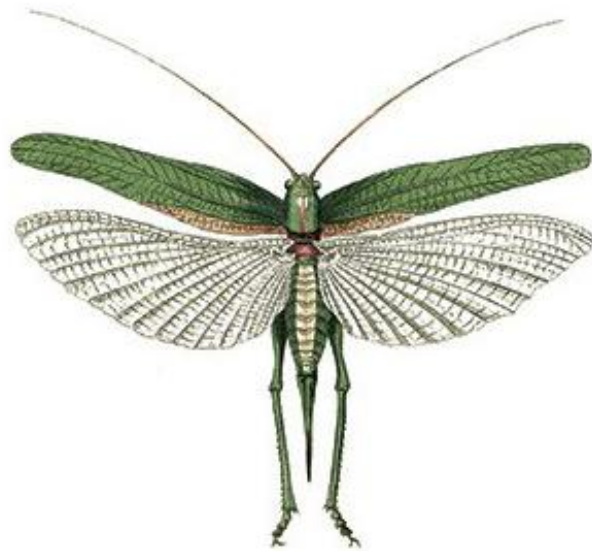


# VALUE ORIENTATION AND THE EFFECT OF FRAMING

## THE ACCEPTANCE OF EDIBLE INSECTS



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*Value orientation and the effect of framing*

*The acceptance of edible insects*

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## Preface

The subject ‘edible insects’ grabbed my interest since I attended a course called Insects as Food and Feed during my Masters at Wageningen University. Not only the facts about insects as a meat substitute, but also the psychological factors that are associated with consuming insects attracted me. I experienced it myself during the course: As disgusted I was at the beginning of the course to only touch a bug, as excited I was at the end of the course to finally taste a bug. What did make me so curious? The increasing knowledge? The images used in the lectures? This was something that stuck with me all the time and ensured me that I wanted to write my Master thesis on this topic. I worked with great pleasure and enthusiasm to this project during the last six months. Sometimes I was lost in the world of quantitative research by doing this for the first time. In the end, I am proud that I developed myself as a researcher, learned more about statistics than I could have ever dreamed of, and was able to retain my motivation to complete this project successfully.

First I would like to thank my supervisor, Marijn Poortvliet, for his professional guidance and support during my thesis process. I am impressed by your experience and I am happy that your constructive feedback stimulated me to think one step further. Furthermore, your enthusiasm kept me motivated.

Secondly, I want to thank my second supervisor, Joop van Loon, for his enthusiastic feedback on my thesis from an insect expert-perspective. Also the opportunity you gave me to present my proposal for the entomology chair group was an experience I never would have wanted to miss.

Furthermore, I wish to thank all the respondents that participated in my research. Without their responses I would never have been able to conduct this research. I also want to thank my thesis-buddies, Eva and Paul, for taking part in my struggles and mental support. Next to them, my parents deserve a special announcement for listening patiently to my stories and for their kind words and wise counselling.

For the readers, I hope I won’t ruin your appetite but I hope that this thesis will make you curious about trying edible insects. Enjoy reading!

Simone Leijdekkers  
Arnhem, July 8, 2016



# Abstract

**Objective** The main aim of this thesis was to examine whether a message, framed in alignment with pre-existing value orientations, would affect attitudes and intentions towards consuming insects. This was undertaken with the perspective of understanding and encouraging the acceptance of edible insects or insect products and lessening the impact that livestock agriculture has on the planet.

**Methods** A person's value orientation was determined by a self-developed 3x3 design approach. To detect other behavioural aspects that were found to be important for the acceptance of edible insects, were determined by the use of the VBN Theory. Furthermore, an experiment was designed. Next to the experiment a quantitative study was undertaken to measure the VBN variables and to detect differences in the outcome variables attitude and intentions towards entomophagy among various (non)experimental groups. Both were conducted via an online survey tool.

**Results** By determining the dominant value orientations, 83% of the respondents could be classified as having a dominant value orientation. The egoistic value orientation showed a negative intention towards entomophagy and people with an altruistic or biospheric value orientation did have positive intentions towards entomophagy. The causal chain of the VBN Theory was successful in explaining a small part of the attitudes and intentions towards entomophagy. This research did not find effects on attitude and intention with targeting people with a certain value orientation with tailored information.

**Conclusions** The results of this study did indicate that the acceptance of edible insects may be enhanced by providing a value framed message instead of only neutral information. The study proposes that targeting ascription of responsibility and the awareness of consequences by means of a message, can be more promising than targeting a specific value orientation to enhance the acceptance of entomophagy in The Netherlands. Also the personal norm is a valuable contributor to the explanation of the intention towards entomophagy.

**Keywords:** Acceptance edible insects, entomophagy, Value Belief Norm Theory, value orientations, dominant value orientation approach, framing.

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## Abbreviations

AC	Awareness of consequences	PN	Personal norm
AR	Ascription of responsibility	SN	Subjective norm
DV	Dependent variable	SRQ	Sub research question
IV	Independent variable	TPB	Theory of Planned Behaviour
NEP	New Environmental Paradigm	VBN	Value Belief Norm Theory
PBC	Perceived behavioural control	M1/M2	Pre- or post-measurement

# 1 Introduction

With regard to the projected growing world population of approximately 9.3 billion people by 2050 (United Nations, 2013), the demand of animal proteins will increase tremendously in the coming years (Wu, et al., 2014; FAO, 2013). The production of animal proteins has a great impact on the environment because of their inefficient feed conversion. For example, about 10 kilos of plant material is needed to produce 1 kilos of beef (Van Der Spiegel, Noordham & Van Der Fels-Klerx, 2013). The Food and Agricultural Organization (FAO) of the United Nations stated in their report (2013) that the earth's finite ecological limits are challenged in view of the rising dietary expectations (FAO, 2013). Furthermore, also a great number of people suffer from nutrient deficiencies (Wu et al., 2014). In order to address these problems, it is necessary to look for opportunities that can serve as a solution or can help to mitigate the problems. A part of the solution can be found in novel protein sources that can provide the world population in an environmentally sustainable and healthy manner in the near future.

Edible insects are a promising alternative protein source, because there is a choice of thousands of species which means that there is a good availability and there is the possibility to alternate between species. Furthermore, they have a high fertility rate, a comparatively high conversion of feed into edible biomass and the nutritional quality of insect protein is comparable to meat (Shelomi, 2015). Taking this into consideration, the production of edible insects has less impact on the environment. The practice of eating edible insects is called entomophagy and is practiced all over the world. Entomophagy can be considered as pro-environmental behaviour. Stern (2000, p.408) has conceptualized pro-environmental behaviour as “*behaviour that is undertaken with the intention to change (normally, to benefit) the environment*”.

In Western societies, edible insects are not accepted as substitute or replacement for meat or a snack (Shelomi, 2015; Tan et al., 2015; DeFoliart, 1992; Yen, 2009). Despite the positive image of butterflies and bees, a lot of insects are mainly viewed as pests and therefore not considered food (Van Huis et al., 2013). If a large part of the protein demand can be shifted towards edible insects, it could be a move towards a more sustainable diet in future. However, it is not realistic to expect edible insects as a self-contained product to realize this shift. A joint cooperation of the government, scientists, insect farmers, food industry and communities is needed to establish an integrated approach to gain knowledge about how to promote a change in behaviour with respect to this context (PBL, 2013; WRR, 2014). But also the civilian, playing his role as a consumer, can't be denied in establishing a more sustainable diet. The consumer is the one who decides whether a product is bought or not. It seems that consumer behaviour is difficult to influence by means of information campaigns (WRR, 2014). This is substantiated by

studies about changing behaviour. Boyes and Stanisstreet (2012) state that providing information to establish a desired attitude or behaviour is not enough. It seems that providing people with tailored information is more effective in encouraging a desired behaviour change (Abrahamse, Steg, Vlek & Rothengatter, 2007). One can think of tailored information as information that is framed in a way that it is relevant for one specific person or a specific group. In this study, this kind of information is referred to as ‘framed’ information.

The main assumption of framing is that an issue can be viewed from a variety of perspectives (Chong & Druckman, 2007). Chong and Druckman (2007) state that framing can stimulate rethinking an issue. The logic behind framing theory posits that individuals have a certain set of beliefs available from memory. These beliefs can be accessed through messages designed to activate the beliefs. Once a belief is activated, an individual subconsciously evaluates if the belief is strong enough or relevant, thus determining the framing effect of the message (Chong & Druckman, 2007; Shen & Edwards, 2005). A growing body of research has indicated that the impact of framing messages with characteristics of a person’s core values is more effective in encouraging pro-environmental behaviour (Cheng, Woon & Lynes, 2011; Shen & Edwards, 2005; Stern, 1992; Abrahamse, Steg, Vlek & Rothengatter, 2007). People have different values that are derived from different life events and issues. A person’s value orientation is defined by researchers as an “important life goal” (Schultz & Zelezny, 2003) and as underlying determinants of attitudes and beliefs (Olson & Zanna, 1993), which serve as guiding principles in a person’s life (Schwartz, 1992). In this study, messages that are framed towards a person’s value orientation are indicated as ‘value framed messages’.

## ***1.1 Research objective and research question***

This research aims to test whether or not people’s value orientations are a potential avenue for framing messages to affect the acceptance of consuming edible insects. The general research question of this research is: *How does value framing affect people’s attitude and intention towards entomophagy in The Netherlands?*

This question is answered by first considering theories that explain behaviour and by looking into value orientations. These two are considered to be important in making decisions concerning the environment. Secondly, a measurement instrument is designed, based upon literature from Chapter 2 to be able to determine a person’s dominant value orientation. Furthermore, this literature is also used to design an experiment. Next to this experiment, the respondents have been asked questions in order to measure different aspects of the behaviour theories and the change in attitude and intention towards edible insects. Ultimately, with the intention of trying to



understand the potential mechanisms that can encourage insect consumption in the everyday diet of participants.

## *1.2 Relevance*

The current scientific literature lacks a connection between values, value framing and insect consumption; consequently this research will speak to this association that has so far gone relatively unaddressed. Furthermore, a new method to measure an individual's dominant value orientation is designed and tested. This method can additionally be developed and tested in future research.

The social relevance of this study is that value framing can enhance a shift towards a more sustainable food provision. This research will contribute to a better understanding of how value framed messages can help to make information campaigns or interventions about novel foods like edible insects in the future.

## *1.3 Thesis outline*

After introducing the central theme of this thesis, the second chapter will present the theoretical framework. This chapter ends with the hypotheses that will be tested in order to answer the sub research questions and therefore the general research question. The methodology is presented in the third chapter, followed by chapter four that contains the results of the study. The final chapter discusses the results, implications, limitations that determine the subjects for further research. Lastly a conclusion is drawn to answer the general research question.

## 2 Theoretical framework

This chapter consists of four paragraphs. The first paragraph describes the state of the art of research about the acceptance of edible insects and gives insight in the different explanations for the Western aversion concerning entomophagy. Subsequently, two major theories about behaviour change are discussed. The third paragraph explains how effective behaviour can be changed or influenced through informative messages. In paragraph 2.5 the concept of value framing is illustrated and lastly hypotheses are formulated upon the literature.

### 2.1 Acceptance of edible insects

The human consumption of insects as food is called entomophagy. Entomophagy is distracted from the Greek *éntomon* which means “insect”, and *phagein* “to eat”. Most of the recent studies about entomophagy focus on the attitude towards the acceptance of insects as food in the Western society (Lensvelt & Steenbekkers, 2014; Looy, Dunkel & Wood, 2014; Verbeke, 2015; Verkerk et al., 2007). There are cross-cultural studies that dealt with the acceptance. These studies compared people in countries where edible insects are part of their daily diet are compared with people in Western countries (Hartmann, Shi, Giusto & Siegrist, 2015; Tan et al., 2015). Other studies focus only on collecting information about countries practicing insect consumption (Chakravorty, Ghosh & Meyer-Rochow, 2013; Obopile & Seeletso, 2013; Zhi-Yi, 1997).

In studies about the acceptance of entomophagy in the Western society, it is found that the lack of acceptance is related to cultural aspects like inappropriateness, fear (of dirt and diseases) and disgust (Illgner & Nel, 2000; Looy et al., 2014; Rozin & Fallon, 1987; Yen, 2009; Young, 1999). Especially the category ‘disgust’ varies greatly across culture (Rozin, 2007). Despite the positive image of butterflies and bees in the Western world, a lot of insects are mainly viewed as pests and therefore considered as disgusting food (Van Huis et al., 2013). If insects touch other edible food, they tend to make it disgusting and inedible (Rozin, 2007). This, despite the vast amount of literature underlying the nutritional and sustainable features of edible insects (Van Huis et al., 2013). This could be partly explained by the lack of exposure to the taste, flavour, visual and tactile sensations of edible insects (Deroy, Reade & Spence, 2015), and partly by the geographical availability of other animal derived protein sources of food such as cattle, pigs, poultry and fish (Harris, 1998).

The acceptance of food, especially novel food like edible insects, depends not only on cultural, emotional and rational dimensions such as palatability, availability and nutritional benefits (Looy et al., 2014; Nemeroff & Rozin, 1989). It has been shown that moral factors like a

person's value orientation, moral obligation and environmental concern are important in predicting behaviour regarding food choices (De Boer, Hoogland & Boersema, 2007; Dowd & Burke, 2013; Raats, Shepherd & Sparks, 1995). In addition, Stern (2000) emphasizes the importance of a person's value orientation for explaining pro-environmental behaviours like ones choice for consuming edible insects.

## ***2.2 Theories explaining behaviour***

Literature contains a broad selection of theories and models which aim to explain behaviour. To answer the research question, two different theoretical models are used which will help to explain how the attitude and intention towards entomophagy arise. The main theory that is used is the Value Belief Norm Theory (VBN Theory) of Stern (2000); this theory is moral-based and mainly used to explain pro-environmental behaviours. For supplementary research the Theory of Planned Behaviour (TPB) of Ajzen (1991) is used. The TPB is a more general used model for explaining a broad perspective of behaviours but was also successful in explaining pro-environmental behaviours or in predicting intentions to purchase organic food (Arvola, 2008). These theories are commonly used to predict the behaviour of people, based upon rational choices. What the VBN Theory and TPB have in common, is that they both are successful in identifying internal factors and underlying beliefs that are related to the actual behaviour (Beedell & Rehman, 2000). Therefore these theories are considered to be suitable for the current study. In this paragraph, both the theories are discussed.

### ***2.2.1 Value Belief Norm Theory***

In order to understand how a person's attitude or behaviour evolves, theories are developed that aim to predict behaviour. One theory that aims to explain pro-environmental behaviour is the Value Belief Norm Theory of Stern and colleagues (e.g. Stern, 2000). A premise of Stern's VBN Theory is that pro-social attitudes and personal moral standards are evidential predictors of pro-environmental behaviour. This means that people who undertake environmental action have at least some self-transcending or moral reasons for doing so.

As mentioned before, Stern (2000, p.408) has conceptualized pro-environmental behaviour as *"behaviour that is undertaken with the intention to change (normally, to benefit) the environment"*. Pro-environmental behaviour can be typically distinguished in three general value orientations, namely egoistic, altruistic or biospheric values. The VBN Theory proposes a causal chain (see Figure 1) that starts from the general values (egoistic, altruistic or biospheric), which form the basis for beliefs on environmental concern (New Environmental Paradigm, NEP), awareness of

consequences and ascription of responsibility, which in turn underlie personal norms which dictate pro-environmental behaviour. The VBN Theory links theories about these concepts.

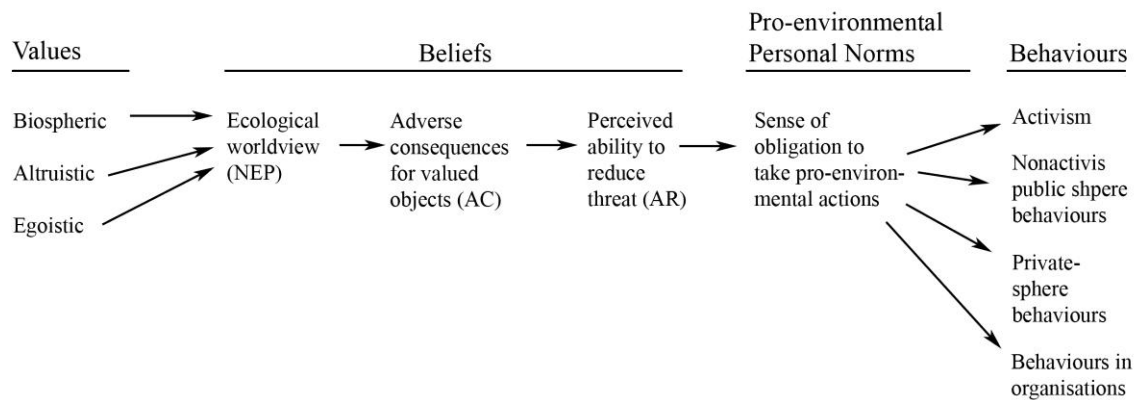


Figure 1 A schematic representation of the Value Belief Norm Theory (Stern, 2000)

*Values.* Within the VBN Theory (Stern, 2000) three values are distinguished: the egoistic values, altruistic values and biospheric values. The three value orientations all have their own rationale. The egoistic value orientation is characterized by concerns for the consequences on one's self regarding authority, social power and wealth. A person with an altruistic value orientation has concerns for the effect of issues on others. Altruism is expressed through a concern for social justice, helpfulness and equality. Third, the biospheric value orientation has concerns for the effect of environmental issues on all living beings and the earth. This is expressed through protecting the environment, preventing pollution and respecting the earth (Stern, Dietz & Guagnano, 1998). Each person has his own values in life. These three main value orientations can motivate people to act pro-environmentally (or not). Stern and Dietz (1994) state in their research that egoistic values are least related to pro-environmental behaviours. On the other hand, the altruistic and biospheric value orientation are positively related to such behaviours. These three value orientations have an impact on the beliefs, the next step in the causal chain of the VBN Theory.

*Beliefs.* Within the VBN Theory, people's beliefs of the world are taken into account. It is assumed that environmental concerns and pro-environmental behaviours result from beliefs about the relationship between humans and the environment (Steg et al., 2005). Beliefs are constructed from the New Environmental Paradigm (NEP; Dunlap & Van Liere, 1978), awareness of consequences (AC beliefs) and ascription of responsibility (AR beliefs). According to the VBN Theory these AC and AR beliefs depend on the NEP.

The NEP is described as the conviction that people have the ability to change or affect nature (Dunlap & Van Liere, 1978). When people have stronger beliefs in this ability, it is assumed that their awareness of the consequences of their behaviour towards the environment will be greater (Stern, 2000). The AC is described as an individual's awareness of adverse consequences to others or the environment of not performing pro-socially behaviour. These AC beliefs relate to the AR beliefs, which are described as "when people think they can adverse these consequences" (Steg et al., 2005, p. 416). So when a person is aware of the potential harm that may come to another (AC) and decides that their actions are responsible (AR) for this harm, then this person is more likely to act in a manner to help the other (Schultz et al., 2005).

*Pro-environmental personal norms.* The third and last concept of the VBN Theory focuses on personal beliefs that will have influence on all kinds of behaviour that are taken with pro-environmental intent (Stern, 2000). This concept stresses the importance of the role of moral obligation to act in favour of the common good. According to Schwartz (1977), behaviour occurs in response to personal norms when people are aware of the consequences and feel responsible for their behaviour.

*Behaviour.* Stern (2000) distinguished four types of behaviour. Active involvement (demonstrations) is described as environmental activism; when someone is supporting the public policies it is described as a non-activist behaviour in the public sphere; purchasing pro-environmental products (like edible insects) it is described as private-sphere environmentalism; when an individual designs environmentally benign products it is distinguished as an organizational action.

As the VBN supposes, values, beliefs and personal norms together are able to predict pro-environmental behaviour. Measuring the actual behaviour regarding entomophagy, can give some difficulties because of the limited availability of edible insects in supermarkets. Attitudes and intentions are strong antecedents of actual behaviour (Ajzen, 1991; Abrahamse & Steg, 2011). Hence, attitude and intention will be measured as outcome measures.

### *2.2.2 Theory of planned behaviour*

The TPB has three components that predict the intention towards behaviour, namely: attitude, subjective norm and perceived behavioural control. According to Ajzen (1991), "the more favourable the attitude and subjective norm, and the greater the perceived control, the stronger should be the person's intention to perform the behaviour in question". For the current study it

can be formulated as; consumers who have a positive attitude towards consuming edible insects, who perceive support from their surroundings and also believe in their own ability to consume edible insects, should have a stronger intention to consume edible insects. The TPB advances the idea that attitudes and intentions are strong antecedents of actual behaviour (Ajzen, 1991). The components attitude and intentions are used in the current research to measure potential outcomes of the experiment.

The Theory of Planned Behaviour (TPB; Ajzen, 1991) is a commonly used theory to predict rational-based behaviour, while the VBN Theory (Stern, 2000) can be described as a moral predictor. According to earlier studies, the TPB can successfully be used in predicting food consumption behaviour (Armitage & Conner, 2001). Therefore, this theory is specifically interesting to further explore this theory for the current study in supplementary research. Below the components of the TPB are shortly described.

*Intention.* The intention towards certain behaviour is an indication of an individual's readiness to perform the behaviour. It is assumed to be an immediate antecedent of behaviour (Ajzen, 2002a). One's intention is based on the attitude towards the behaviour, subjective norm, and perceived behavioural control. Each predictor is weighted for its importance in relation to the behaviour and population of interest.

*Attitude.* An individual has beliefs about the outcomes of certain behaviour. The positive or negative evaluation of self-performance of this particular behaviour, determines the attitude towards a behaviour (Ajzen, 1991).

*Subjective norm.* The subjective norm can be defined as the social pressure that a person perceives to perform (or not) a behaviour (Ajzen, 1991). Social pressure can be experienced from family, friends or other direct social surroundings. A subjective norm arises from the perceived expectation of others towards a certain behaviour and the motivation to comply with this behaviour.

*Perceived behavioural control.* The perceived behavioural control, is the perception of the ability you have to perform the behaviour (Ajzen, 1991). Behaviour can be facilitated or hindered by factors. The perceived behavioural control consists out of the ability to control these factors and the perceived power of each factor.

## *2.3 Changing behaviour through messages*

Schultz (2002) states in his knowledge-deficit theory that people will not change their behaviour until they understand how and why they should make a change. A lack of understanding a problem can be a barrier to change, as individuals are not always aware of the consequences of their behaviour. Studies that investigated how information can change behaviour showed that the behaviour of consumers is difficult to influence through information alone (Boyes & Stanisstreet, 2014; WRR, 2014). Gardner and Stern (2002) found that providing straightforward information in messages can make differences in behaviour, particular in behaviour that is found to be changed easily and with low costs. The effectiveness of information campaigns on changing behaviour is not proven (Abrahamse, Steg, Vlek & Rothengatter, 2005). Barr and Gilg (2007) put forward that the lack of effectiveness of information messages to change behaviour is that this message often ignores a person's motives for engaging in certain behaviour. According to Stern (2000), pro-environmental behaviour arises from an individual's value orientation.

With the knowledge that informative messages can make a difference in changing behaviour and knowing that they are not very successful in doing so, it is useful to look at how these messages can be made more effective.

## *2.4 Value Framing*

Framing is a technique that can stimulate rethinking an issue and can be used in information messages (Chong & Druckman, 2007). Spence and Pidgeon (2010) found that framing a message in specific ways has been shown to have an effect on the intended outcome of a message. A technique to frame a message that stimulates pro-environmental behaviour is by using a 'gain' or 'loss' frame. Spence and Pidgeon (2010) found that when climate change was framed in terms of gains (e.g. "by mitigating the climate change, we can prevent further increase of winter floods"), it was more effective compared to a message that was loss-framed ("without mitigating climate change, we will further increase winter floods"). The gain-frame was found to be more effective.

Shen and Edwards (2005) have recognized the importance of values in individual decision making and opinion formation. It seems that providing people with tailored information is more effective in encouraging a desired behaviour change (Abrahamse, Steg, Vlek & Rothengatter, 2007; Petty & Wegener, 1999). People have a tendency to only process information that is relevant for them (Chong & Druckman, 2007). The logic behind framing is that pre-existing values and beliefs can be activated through messages that are tailored towards these values and beliefs (Chong & Druckman, 2007). An individual evaluates subconsciously the strength of a

certain value or belief and that determines the framing effect of the message (Chong & Druckman, 2007; Shen & Edwards, 2005).

In a study concerning humanitarian and individualistic media frames on welfare reform, Shen and Edwards (2005) demonstrated that individual's values did have important implications on the outcomes given different message frames. Persons who scored highly on individualism and humanitarianism had a greater response to the message that matched those values. Taylor (2000) also describes an effect of messages that emphasize certain aspects that match values of a person and when the issue is connected to someone's life through pre-existing beliefs.

Schultz and Zelezny (2003) state that environmental messages are usually framed by altruistic or biospheric concerns. In their article they called for a "reframing" of environmental messages. With reframing they mean that rather than appealing to the altruistic or biospheric values, the message appeals to the egoistic value. While Schultz and Zelezny (2003) speculated on the effectiveness of the reframing of communication, they did not give an empirical evidence to support their speculation. It might be the case that an egoistic framed message concerning the environment, would appeal to people with an egoistic value orientation but not to those with altruistic or biospheric values. Therefore, it is interesting to look at how value framing can affect consumer's attitude and intention towards entomophagy.

By appealing to values that are most important for an individual through value framed messages, a more effective outcome can be expected. This may also help to understand the differences in how people with different value structures interpret information and this may increase the attitudes and intentions towards edible insects through a value framed message.

Given that values are related to a person's food choices, it's probable that people with different value orientations, respond differently to messages that are 'framed' at the indicators of the three main values. In this context, framing means that an issue is put forward, using words that appeal to one's value orientation. This technique is also used to manipulate people when aiming for a change in behaviour.

## 2.5 Hypotheses

In this paragraph, hypotheses were formulated in order to answer the general research question. The general research question being asked is "*How does value framing affect people's attitude and intention towards entomophagy in the Netherlands?*"

The first sub research question "How are different values, beliefs and norms related to the attitude and intention towards entomophagy?" was tested by the following hypothesis. This



hypothesis is built upon research of Schultz and Zelezny (2003) which describe the positive interaction between the altruistic and biospheric value orientation and pro-environmental behaviour and the egoistic value orientation, which has a negative interaction.

Hypothesis 1a: The altruistic and biospheric value orientation will lead to a more positive attitude and intention towards entomophagy compared to the egoistic value orientation, which will lead to a negative attitude and intention towards entomophagy.

Hypothesis 1b: Beliefs on environmental concern (AC, AR and NEP) and personal norms will have a positive association with the attitude and intention towards entomophagy.

In order to check whether a framed message with information about edible insects and insect products on its own does have influence on the attitude and intention, the second hypothesis is formulated in order to answer the sub research question “What is the effect of value framing on the attitude and intention towards entomophagy?”.

*Hypothesis 2:* The value framed message in itself, regardless of what value frame is used, enhances the attitude and intention to consume insects. As a result there will be a more positive response by the respondents who received a framed message compared to the respondents that received a neutral message.

In order to answer the sub research question “Does value framing create a more effective message, therefore changing the attitude and intention towards entomophagy?”, the following hypothesis is tested. It assesses that when a value framed message aligns with a person’s value orientation the attitude and intention will be stronger influenced than when they do not align.

*Hypothesis 3:* A greater and more positive change in attitudes and intentions will occur when the message frame aligns with a person’s values. The altruistic and biospheric oriented message will appeal to people with stronger altruistic and biospheric values and the egoistic oriented message will appeal to those with stronger egoistic values.

After exploring the VBN Theory and the TPB, it is clear that both models can successfully be used to explain behaviour. As described that the VBN Theory is a moral-based and does not include rational-based motivations for behaviour. The TPB explains behaviour from a rational perspective and does not include moral factors to explain behaviour. This indicates that both theories have to deal with a moral-rational gap. In supplementary research of this thesis, this gap is tried to be captured by adding a person’s moral obligation (indicated as personal norm from

the VBN Theory) to the TPB. This extension has already been done by other researchers (e.g. Parker, Manstead & Stradling, 1995) and it was found that adding the moral obligation to the TPB was successful in increasing the proportion of explained variance in intentions towards behaviour. Especially Harland, Staats and Wilke (1999) found that adding personal norm to the TPB led to an increased explained variance in the intention to take pro-environmental action. Therefore, it was found to be interesting for the current study to assess whether this also accounts for the intention towards entomophagy.

*Supplementary research:* The Theory of Planned Behaviour is successful in explaining the intention towards entomophagy. When the moral-rational gap is bridged by adding personal norm to the TPB, the explained variance will increase.

## 3 Methods

### 3.1 Participants and design

The research population for this study were adult inhabitants of The Netherlands aged 18 years or older. The sample was collected randomly because the research subjects did not need to have specific characteristics. In order to get a varied research population, the survey has been distributed via social media like Facebook, LinkedIn, online communities and various Dutch forums. There was also an announcement with a link to the survey in a press release for free local newspapers in The Netherlands. The survey was conducted in one session and was available from April 19<sup>th</sup> 2016 until May 13<sup>th</sup> 2016 (32 days). The participants could win one out of five VVV gift cards when they completed the full survey. In total, 383 participants started the survey. With a completion rate of 71%, only 272 respondents successfully completed the survey and the data they provided were suitable for analysis.

### 3.2 Procedure

To collect the data needed for this research, a survey was designed in Qualtrics (online data collection software). The full questionnaire (in Dutch) can be found in Appendix A. The difference between edible insects and insect products was firstly described to the participants. As shown in Figure 2 on the next page, prior to the experiment, there were some questions asked about the participants' values, beliefs and norms concerning the environment and perceived behavioural control regarding entomophagy. In the second section there was a pre-measure of the independent variables attitude to insect consumption and the intention to eat insects. In the

third section, each participant was randomly assigned to either one of the three experimental groups (egoistic-, altruistic- or biospheric value framed message), or in the neutral group.

It was the intention to keep the survey as short as possible in order to retain the participant's full attention. Likewise, the value framed message needed to be as short as possible to enhance the ease of reading and to minimise the time needed to read it. There was a manipulation check where respondents had to answer questions related to the message they received. This was done to ensure that the respondents had read the message and to enhance the elaboration of the value framed message. Fourth, a post-measurement of the independent variables was carried out. These post-measurements of the dependent variables were formulated differently from the pre-measurement in order to prevent desired answers. The survey ended with questions about demographics and via which channel they arrived at this questionnaire (via social media or a local newspaper). The survey was conducted in Dutch, since the research population lived in The Netherlands.

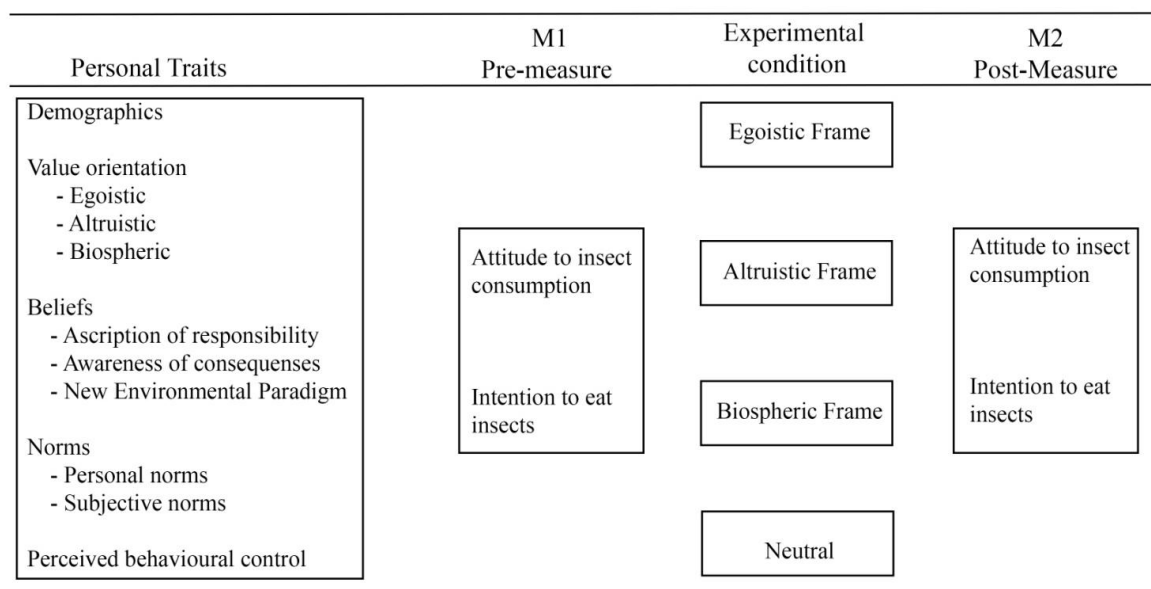


Figure 2 Survey design

### 3.3 Experimental conditions

The value framed messages were based upon the indicators Steg et al. (2005) which were also used to determine the dominant value orientation of a person (see paragraph 3.4, Table 1). A distinction was made between edible insects and insect products. This distinction was found to be important because these two are assumed to differentiate in attitude and intention towards entomophagy (Tan et al., 2015). For the egoistic condition, edible insects and insect products were presented as products that are important for authority, social influence and wealth. In the

altruistic condition they were presented as relevant for pursuing equality, helpfulness and social justice. The biospheric condition focussed more on protecting the environment, preventing pollution and respecting the earth. Furthermore, the three value framed messages were all formulated with a gain-frame (positive outcomes), because this frame was found to be most effective (Spence & Pidgeon, 2010). In the neutral condition, none of these items were used in the message, only facts about the consumption of edible insects and insect products were given.

### **3.4 Measurements**

In this paragraph the indicators for each concept are described. The indicators were measured with a 7-point Likert (-type) scale. When measured differently, it is stated below. The internal validity and reliability of the dependent variables (DV's) were tested using a factor analysis and Cronbach's Alpha ( $\alpha$ ). As a rule of thumb, the items that form one DV can be considered to be reliable if  $\alpha > .60$ . The data were processed and analyzed in IBM SPSS version 23.

*Values.* Schultz (2001) made the distinction between three value orientations regarding environmental concern, namely: egoistic-, altruistic- or biospheric value orientation. For the current study the Dominant Value Orientation Approach was designed in order to determine an individual's value orientation. The indicator for egoistic sounded like "In my life, I find it more important to have the right to lead or command". For the altruistic value orientation it sounded like "In my life, I find it more important to correct injustice and care for the weak", and the biospheric statement sounded like "In my life, I find it more important to protect the environment and preserve nature".

*The Dominant Value Orientation Approach.* This instrument was self-designed and inspired by the six-item dominant achievement goal approach by Van Yperen (2006). To determine a dominant value orientation, nine pair wise considerations were presented to the respondent with items of the three value orientations, based upon Stern et al. (1999) (see Table 1). A particular value orientation was considered to be preferred by the participant if it was chosen for five or six times for one of the value orientations. If participants did not consistently prefer a particular value orientation, it was assumed that they did not have a dominant value orientation. In the current study, it was possible to identify a dominant value orientation for 83.1% ( $N = 226$ ). The other 16.9% ( $N = 46$ ) did not have a distinct profile. This percentage may also include the random and careless responders.

Table 1: Dominant Value Orientation Approach

For each item, circle either A or B In my life, I find it more important...			
A			B
1	...to have the right to lead or command	or	...to have equality: an equal opportunity for all
2	...to correct injustice and care for the weak	or	...to respect the earth: live in harmony with other species
3	...to protect the environment and preserve nature	or	...to have control over others
4	...to have control over others	or	...to work for the welfare of others
5	...to work for the welfare of others	or	...to have material possessions and money
6	...to prevent pollution	or	...to correct injustice and care for the weak
7	...to have material possessions and money	or	...to prevent pollution
8	...to have equality: an equal opportunity for all	or	...to protect the environment and preserve nature
9	...to respect the earth: live in harmony with other species	or	...to have the right to lead or command

Note. The items are adopted from the value orientations of Steg et al. (2005). The three items that correlated the strongest as judged by the results of the factor analysis are used for the construction of this instrument.

*Attitude towards entomophagy.* To measure attitude, it is most common to use semantic differential scales (Ajzen, 2002b). The scale generally has four or more scale items consisting of two components; one component being of an instrumental nature (harmful - beneficial) and the other a more experiential quality (pleasant - unpleasant) (Ajzen, 2002b). An example from the survey was “I think it is important / unimportant to buy edible insects”. This was also asked for insect products. The attitude was measured prior to, and after the value framed message (pre-measurement, M1, and post-measurement, M2). Attitude towards edible insects and insect products are both measured at two points in time, the construction of the scale and Cronbach’s Alphas are visible in Table 2.

Table 2: Scale construction of DV attitude and reliability Cronbach’s Alpha

Dependent Variable	Items	$\alpha$
Attitude towards edible insects (M1)	5 items (9.1-9.5)	.78
Attitude towards insect products (M1)	5 items (10.1-10.5).	.85
Attitude towards edible insects (M2)	5 items (18.1 - 18.5).	.83
Attitude towards insect products (M2)	5 items (19.1-19.5).	.86
Attitude towards entomophagy (M1)	10 items (9.1 - 10.5)	.90
Attitude towards entomophagy (M2)	10 items (18.1 - 19.5)	.91

*Intention towards entomophagy.* Intentions were also measured via a series of questions with a 7-point Likert-type scale, asking “how much do you agree or disagree with the following statement”. The questions tried to encapsulate a potential change in behaviour. The intention scale question sounded like “I intend to replace conventional protein sources like cattle, pig, chicken and fish for edible insects”. Also for intention the distinction was made by separating edible insects from insect products. For the measurement of intention the same applies as for attitude, it was

measured twice (pre-measurement, M1, and post-measurement, M2). The intention scales were found to be reliable, Cronbach's  $\alpha$  can be found in Table 3.

Table 3: Scale construction of DV intention and reliability Cronbach's Alpha

Dependent Variable	Items	$\alpha$
Intention towards edible insects (M1)	3 items (11.1-11.3)	.96
Intention towards insect products (M1)	3 items (12.1-12.3)	.95
Intention towards edible insects (M2)	3 items (20.1-20.3)	.95
Intention towards insect products (M2)	3 items (21.1-21.3)	.96
Intention towards entomophagy (M1)	6 items (11.1 - 12.3)	.97
Intention towards entomophagy (M2)	6 items (20.1 - 20.3)	.97

Since there was no significant difference found between edible insects and insect products in this research for attitudes and intentions, the two were merged to attitude or intention towards entomophagy (M1 or M2). Also Cronbach's Alpha showed a reliable result when attitudes and intentions for edible insects and insect products were merged (see Table 3). In the following chapter (Results), footnotes will indicate the separated attitude towards edible insects or insect products, only when results showed a statistical significant difference.

*Beliefs.* The role of environmental concern was measured in beliefs. In the VBN Theory, beliefs consist of a person's worldview in the New Environmental Paradigm (NEP), the awareness of consequences (AC), and ascription of responsibility (AR). The AC beliefs were measured through providing the respondent a statement which they should rate. A statement could look like "Sustainable food choices can help constrain the global warming", the respondent was asked to rate this question on a 7-point scale between "true" and "false". The AR beliefs are measured in the same way. The statements sounded like "I am jointly responsible for the world food scarcity".

The NEP was measured using a modified version of the NEP scale (Dunlap, 2008). In this scale people can give their opinion about the environment. Respondents were asked how much they agree or disagree with the statements. The statements sounded like "We are approaching maximum number of people the Earth can support". This measurement was done after the AC and AR beliefs, in order to avoid socially desirable answers. All scales were found to be reliable with an  $\alpha > .60$  (see Table 4).

*Personal norms.* The personal norm (PN) in the VBN Theory examines the feeling of moral obligation to act pro-environmentally. The personal norm may influence all kinds of behaviours taken with pro-environmental intent. The PN was also measured through providing statements.

A statement can sound like “I feel personally obliged to eat as environmentally sustainable as possible”. This scale was found to be reliable (see Table 4).

Table 4: Scale construction of VBN variables and reliability Cronbach’s Alpha

Variable	Items	$\alpha$
AC beliefs	6 items (4.1-4.6)	.84
AR beliefs	6 items (5.1-5.6)	.69
NEP	15 items (6.1-6.15)	.78
PN	9 items (7.1-7.9)	.91

*Supplementary research: TPB.* The variables of the TPB (Ajzen, 1991), normative beliefs and perceived behavioural control, were measured in order to make a comparison between the influence of rational, versus moral factors in attitude and intention formation in the case of attitude and intention towards entomophagy.

*Subjective norm.* The subjective norm was measured with “People that are important to me would disapprove it, when I would eat edible insects or insect products”. The questions for subjective norm are formulated in a manner that they need to be re-coded before they are analysed.

*Perceived behavioural control.* The PBC was measured with statements like “If I want, I can eat edible insects or insect products any time”. The reliability of these scales is presented in Table 5.

Table 5: Scale construction of TPB variables and reliability Cronbach’s Alpha

Variable	Items	$\alpha$
Subjective Norm	2 items (8.1 and 8.2)	.61
Perceived Behavioural Control	4 items (8.3-8.6)	.59

*Manipulation check.* In order to check whether participants read the value framed messages, thus to determine whether the intervention was successfully, a manipulation check was part of this study. The participants were presented with questions like “What issue was addressed in the message?”. These questions had to be answered by selecting one out of a few options in order to ensure the participant had read the value framed message, and to enhance the elaboration of the value framed message. Also 9 questions with a 7-point Likert’s scale were asked each with a characteristic of one of the value framed messages. It was asked to which extent the answer was right according to the message. Three scales are formed by means of each value framed message. The egoistic manipulation check scale yielded a reliability of  $\alpha = .74$ . The altruistic manipulation

check scale had a low reliability with  $\alpha = .45$ , and the Cronbach's Alpha for the biospheric manipulation check scale was  $\alpha = .82$ .

### *3.5 Statistical analysis*

In order to test hypothesis 1a, first the dominant value orientation was determined, using the self designed Dominant Value Orientation Approach. Secondly, an ANOVA was conducted to compare the means of attitudes and intentions (M1) between the value orientations. To be able to test the hypothesized differences between the value orientations in attitude and intention, specific contrasts are planned (Furr & Rosenthal, 2003; Rosnow & Rosenthal, 1995).

To test hypothesis 1b, a series of regression analyses was conducted. The procedure of Steg et al. (2005) was followed, which implies that each variable in the causal chain of the VBN Theory was regressed onto the preceding variable in the causal chain. First, the variable directly preceding the dependent variable was entered in the regression analysis (model 1). Secondly, it was examined whether all other precedent variables explained additional variance in the intention and attitude towards entomophagy (model 2). This procedure makes it possible to test whether variables also directly affect variables further down the chain when intermediate variables are controlled for (Steg et al., 2005). The chance of a Type 1 error is increased by these multiple regressions. Therefore, a Bonferroni correction was used, resulting in a significance level for the 7 regression analyses of  $p < .007$  (.05 divided by 7).

For hypothesis 2, a factorial ANOVA was conducted to compare the means of the three experimental conditions (value framed messages) with the neutral condition and each condition is mutually compared by means of the attitudes and intentions (M2). The conditions included three levels (egoistic value framed message, altruistic value framed message and biospheric value framed message).

For hypotheses 3 a factorial ANOVA (4x4) was conducted. The interaction effects between a person's value orientation and the condition they received was measured for the attitude and intentions towards entomophagy (M2). The value orientation included four levels (egoistic-, altruistic-, biospheric- and no dominant value orientation) and there were also four levels in the condition (an egoistic-, altruistic-, biospheric- condition and a neutral condition).

### *3.6 Supplementary research*

The Theory of Planned Behaviour (Ajzen, 1991), was found to be interesting because it is a commonly used theory that explains behaviour. Furthermore, in this study, the components attitude and intention of the TPB are used as an indicator for behaviour. The VBN Theory



measures the actual behaviour. In case of edible insects, it is difficult to measure the actual behaviour in The Netherlands because the availability is still limited, therefore attitude and intention are used as indicator.

The TPB approaches behaviour from a rational perspective, while the VBN Theory is a moral based theory. Parker and colleagues (1995) added personal norm to the TPB. In order to bridge the moral-rational gap in this model, it was found that personal norms are a valuable contributor in the TPB related to explaining variance in behaviour.

To test the TPB, also with the added personal norm, a regression analysis was performed. The variables of the TPB - subjective norm and perceived behavioural control - are measured in order to reveal whether the personal norms contributed to the model.

## 4 Results

### 4.1 Manipulation check

A manipulation check was conducted to check whether the experiment was successful. The manipulation check deviated from an equal division for each question in each condition (Table 6), which means that most respondents read and understood the value framed message. Results that are related to the experiment can be assigned to the experiment.

Table 6: Manipulation check for each condition.

Condition	Q13		Q14		Q15		Q16	
	<i>df</i>	$\chi^2$	<i>df</i>	$\chi^2$	<i>df</i>	$\chi^2$	<i>df</i>	$\chi^2$
Ego	(2, 64)	116.28***	(1, 64)	52.56***	(3, 64)	45.13***	(3, 64)	94.13***
Alt	(1, 68)	64.06***	(1, 68)	64.06***	(3, 68)	158.94***	(3, 68)	29.06***
Bio	(1, 70)	66.06***	(1, 70)	62.23***	(2, 70)	106.40***	(1, 70)	62.23***
Ntr	(3, 70)	72.29***	(1, 70)	4.63*	(2, 70)	57.14***	(3, 70)	103.83***

\*  $p < .05$  \*\*\*  $p < .001$

The additional manipulation check did only show statistical significant results for the respondents that received the biospheric value framed message,  $F(3, 66) = 6.00, p < .01$  (see Table 7 on the next page). It can be assumed that the egoistic and altruistic condition did not successfully manipulate the respondents.

Table 7: Manipulation check on value orientation

Value framed message	Value orientation	<i>N</i>	<i>M</i>	<i>SD</i>	<i>F</i>
Egoistic	Not dominant	10	4.80	1.54	.801
	Egoistic	4	5.00	.82	
	Altruistic	23	5.30	1.23	
	Biospheric	27	5.54	1.44	
	Total	64	5.31	1.35	
Altruistic	Not dominant	12	5.50	.86	1.14
	Egoistic	4	4.67	1.25	
	Altruistic	26	5.23	.96	
	Biospheric	26	5.03	.88	
	Total	68	5.17	.93	
Biospheric	Not dominant	11	4.91	1.54	6.00**
	Egoistic	2	3.17	3.06	
	Altruistic	32	5.94	.98	
	Biospheric	25	5.77	.81	
	Total	70	5.64	1.20	

\*\* $p < .01$ 

## 4.2 Descriptives

The 272 respondents that successfully completed the survey came from across The Netherlands. Of the respondents, 270 were raised in The Netherlands, one was raised in Australia and one in the US. In the sample, 78 participants were male (29%) and 194 were female (71%). The age ranged from 19 till 99 ( $M = 37.76$ ;  $SD = 15.48$ ). A considerable part of the sample was highly educated; 43% completed Science Education (WO) ( $N = 118$ ), 37% of the respondents joined a University of Applied Sciences (HBO) ( $N = 100$ ) and 12% of the respondents achieved an Intermediate Vocational Education level (MBO) ( $N = 32$ ). The respondents that participated through free local newspapers were in the minority ( $N = 43$ ), the other 229 respondents were approached by social media like Facebook, LinkedIn and several forums. The meat consumption of the respondents was divided in 51% that consumed meat every day ( $N = 138$ ), 25% consumed meat up to three times per week ( $N = 69$ ), 19% consumed less than three times per week ( $N = 52$ ) and 5% consumed no meat at all ( $N = 13$ ). The majority of the respondents (69%,  $N = 189$ ) did not have any experience with eating edible insects or insect products. 17% of the respondents ( $N = 47$ ) tried edible insects, 5% tried insect products ( $N = 13$ ) and 8% tried both ( $N = 23$ ).

People who had experience in eating edible insects, insect products or both had a significant higher attitude ( $M = 5.03$ ,  $SD = 1.04$ ,  $F(3, 268) = 8.945$ ,  $p < .001$ ) and intention ( $M = 5.34$ ,  $SD = .86$ ,  $F(3, 268) = 14.773$ ,  $p < .001$ ) towards entomophagy in contrast to people who did not have experiences.

### 4.3 Value Belief Norm Theory

Table 8 presents the means ( $M$ ), standard deviations ( $SD$ ) and the correlations between the variables of the VBN Theory as used in the model. As can be seen in the table, all variables correlate positively with the attitude and intention towards entomophagy (M1).

Table 8: Means, SD and correlations between variables VBN Theory

	$M$	$SD$	1	2	3	4	5
1. New Environmental Paradigm	4.66	.70					
2. Awareness of Consequences	5.25	1.11	.38**				
3. Ascribed Responsibility	4.69	.94	.34**	.68**			
4. Personal Norm	4.45	1.21	.39**	.64**	.55**		
5. Attitude towards entomophagy (M1)	4.52	1.06	.13*	.27**	.19**	.22**	
6. Intention towards entomophagy (M1)	3.62	1.77	.15*	.37**	.33**	.36**	.52**

Note. \*  $p < .05$  \*\*  $p < .01$

#### 4.2.1 Value orientations related to attitude and intentions

In order to answer the sub research question *How are different values, beliefs and norms related to the attitude and intention towards entomophagy?* the following hypotheses were formulated:

H<sub>1a</sub> The altruistic and biospheric value orientation will lead to a more positive attitude and intention towards entomophagy compared to the egoistic value orientation, which will lead to a negative attitude and intention towards entomophagy.

H<sub>1b</sub> Beliefs on environmental concern (AC, AR and NEP) and personal norms will have a positive association with the attitude and intention towards entomophagy.

The observed percentages of the individuals' dominant value orientation deviated from an equal division across the three value orientations and one not-dominant group,  $\chi^2(3, N = 272) = 94.35$ ,  $p < .001$ . In 46 cases (16.9%) it was not possible to determine a dominant value orientation (not-dominant group). Next to this not-dominant group, three other groups of value orientations could be distinguished, namely: Egoistic value orientation ( $N = 14$ ), Altruistic value orientation ( $N = 114$ ), Biospheric value orientation ( $N = 98$ ).

In order to test hypothesis 1a, an ANOVA was conducted to compare the means of attitudes and intentions towards entomophagy (M1) between the four groups. As can be seen from Table 9, no significant effect of the value orientation on attitude or intention towards entomophagy was found. Only a marginal effect of the differences between groups on the intention towards entomophagy was found,  $F(3, 268) = 2.469, p = .062$ .<sup>1</sup>

Table 9: ANOVA table with Means (M), Standard Deviations (SD) for the groups in value orientations for attitude and intention (M1)

	Value orientation	N	M	SD	F	df
Attitude (M1)	Not dominant	46	4.47	.89	.94	3, 268
	EGO	14	4.11	1.24		
	ALT	114	4.52	1.06		
	BIO	98	4.61	1.11		
Intention (M1)	Not dominant	46	3.59	1.77	2.47†	3, 268
	EGO	14	2.82	1.67		
	ALT	114	3.45	1.75		
	BIO	98	3.95	1.77		

Note. †  $p < .1$

As advocated by Furr and Rosenthal (2003) and Rosnow and Rosenthal (1995), contrasts were computed to test the specific hypotheses. These planned contrasts revealed some interesting significant differences.

These planned contrasts revealed significant differences. Contrast 1, comparing the not dominant group with the biospheric value oriented group, showed no effect on attitudes and intentions (M1). Contrast 2, where the egoistic group is compared to the biospheric group, showed a significant difference for intention towards entomophagy (M1),  $t(268) = 2.25, p = .026$ . Contrast 3, where the not dominant and egoistic group are compared to the altruistic and biospheric group, showed a significant difference in intention (M1),  $t(268) = 2.01, p = .045$ . Another significant difference was found in Contrast 4. In this contrast the egoistic group is compared to the altruistic, biospheric and non dominant group. A significant effect was visible for intention towards entomophagy (M1),  $t(268) = 1.97, p = .050$ . Contrast 5 tested the hypothesized difference between the egoistic group versus the altruistic and biospheric group. This contrast showed also only a significant difference for the intention towards entomophagy

<sup>1</sup> When splitting intention into ‘edible insects’ and ‘insect products’ it becomes visible that there was significant effect of the value orientation and intention towards edible insects,  $F(3, 268) = 3.09, p = .028$ . The three other outcome variables indicated no significant effect; attitude towards edible insects  $F(3, 268) = 1.20, p = .311$ , attitude towards insect products,  $F(3, 268) = .615, p = .606$ , intention towards insect products  $F(3, 268) = 1.79, p = .149$ .

(M1),  $t(268) = 2.05, p = .042$ . In Table 10 an overview is given of the hypotheses that were tested and their  $t$  values.

Table 10: Contrasts

Contrast	Value orientation(s) vs. Value orientation(s)		DV(M1)	$t$
1	Not dominant (-1)	Biospheric (1)	Attitude	.73
			Intention	1.13
2	Egoistic (-1)	Biospheric (1)	Attitude	1.63
			Intention	2.25*
3	Not dominant (-1), Egoistic (-2)	Altruistic (1), Biospheric (2)	Attitude	1.64
			Intention	2.01*
4	Egoistic (-5)	Not dominant (1), Altruistic (1) and Biospheric (3)	Attitude	1.53
			Intention	1.97*
5	Egoistic (-4)	Altruistic (1) and Biospheric (3)	Attitude	1.59
			Intention	2.05*

\*  $p < .05$

#### 4.2.2 The effect of beliefs and personal norms

To test hypothesis 1b, a series of regression analyses was conducted. Table 11 on the next page shows the results of these analyses aimed to test the VBN Theory. All models were at a significant level lower than .001 and therefore the Bonferroni requirement of  $p < .007$  was met for all regression analyses.

Personal Norm is positively associated with the attitude towards entomophagy ( $\beta = .22, p < .001$ ) and explains 4.9% of the variance in the attitude ( $R^2 = .049, F(1, 270) = 13.82, p < .001$ ). When all variables further up in the causal chain were entered in the regression analysis as well, 7.9% of the variance in attitude was explained ( $R^2 = .079, F(4, 267) = 5.70, p < .001$ ). Only AC beliefs was found to be a significant contributor to this model ( $\beta = .23, p < .05$ ). PN explained 12.7% of the variance in intention ( $R^2 = .127, F(1, 270) = 39.22, p < .001$ ) and is also positively related ( $\beta = .36, p < .001$ ). When adding the other variables further up in the causal chain, 16.8% of the variance in intention was explained ( $R^2 = .168, F(4, 267) = 13.44, p < .001$ ). Here PN ( $\beta = .19, p < .05$ ). and AC ( $\beta = .19, p < .05$ ) were found to be significant contributors to this model.

In the second phase of the regression analysis, AR beliefs explained 30.4% of the variance in PN ( $R^2 = .304, F(1, 270) = 117.79, p < .001$ ). Model 2, where all following variables of the VBN Theory are included, explained 45.1% of the variance in PN ( $R^2 = .049, F(3, 268) = 73.40, p < .001$ ). All the variables, AR ( $\beta = .19, p < .01$ ), AC ( $\beta = .48, p < .001$ ) and NEP ( $\beta = .15, p < .001$ ), made a significant contribution to this model.

The third phase showed that AC beliefs explained 46.6% of the variance in AR beliefs ( $R^2 = .446, F(1, 270) = 235.98, p < .001$ ). AC and NEP together explained 47.4% of the variance in

AR beliefs ( $R^2 = .474$ ,  $F(2, 269) = 121.40$ ,  $p < .001$ ). Both the variables made a significant contribution to this model, AC ( $\beta = .65$ ,  $p < .001$ ), NEP ( $\beta = .10$ ,  $p < .05$ )). Finally, NEP explained 13.9% of the variance in AC and was highly significant ( $\beta = .38$ ,  $p < .001$ ,  $R^2 = .139$ ,  $F(1, 270) = 44.74$ ,  $p < .001$ ).

Table 11: Multiple Regression Analyses of attitude and intention towards entomophagy

Phase		$\beta$	$t$	$R^2$	$df$	$F$	$F$ Change	$\Delta R^2$
1	<i>DV: Attitude</i>							
	Model 1			.049	1, 270	13.82***		
	PN	.22	4.02***					
	Model 2			.079	4, 267	5.70***	2.89*	.030
	PN	.08	.95					
	AR	-.01	-.15					
	AC	.23	2.51*					
	NEP	.02	.36					
	<i>DV: Intention</i>							
	Model 1			.127	1, 270	39.22***		
	PN	.36	6.26***					
	Model 2			.168	4, 267	13.44***	4.35**	.041
	PN	.19	2.54*					
	AR	.11	1.40					
	AC	.19	2.18*					
	NEP	-.04	-.60					
2	<i>DV: PN</i>							
	Model 1			.304	1, 270	117.79***		
	AR	.55	10.85***					
	Model 2			.451	3, 268	73.40***	35.96***	.147
	AR	.19	3.10**					
	AC	.45	7.06***					
3	<i>DV: AR</i>							
	Model 1			.466	1, 270	235.98***		
	AC	.68	15.36***					
	Model 2			.474	2, 269	121.41***	4.12*	.008
	AC	.65	13.55***					
4	<i>DV: AC</i>							
	Model 1			.139	1, 270	44.74***		
	NEP	.38	6.69***					

DV: Dependent Variable; PN: Personal Norm; AR: Ascription of Responsibility; AC: Awareness of Consequences; NEP: New Environmental Paradigm. \*  $p < .05$  \*\*  $p < .01$  \*\*\*  $p < .001$

## 4.4 Value Framing Effects

In order to answer the sub research question ‘*What is the effect of value framing on the attitude and intention towards entomophagy?*’, the following hypothesis was formulated:

H<sub>2</sub> The value framed message in itself, regardless of what value frame is used, enhances the attitude and intention to consume insects. As a result there will be a more positive response by the respondents who received a framed message compared to the respondents that received a neutral message.

A factorial ANOVA was conducted to compare the means of the three experimental conditions (value framed messages) with the neutral condition and every condition is mutually compared on means of the attitudes and intentions (M2).

No significant effect was found between the groups in attitude and intention towards entomophagy. However, comparing the neutral condition with the three value framed conditions via contrasts, a significant effect is revealed in attitude  $t(3, 268) = 2.20, p = .029$ . The intention showed no significant effects. It is visible from Table 12 that there were higher means for the altruistic and egoistic framed conditions. The biospheric condition showed a lower mean than the neutral condition.<sup>2</sup>

Table 12: Means for attitude and intention towards entomophagy in the four provided conditions

Value framed condition			<i>F</i>	<i>df</i>	<i>t</i>
Attitude (M2)			1.78	3, 268	2.20*
	<i>M</i>	<i>SD</i>			
Egoistic condition	4.82	1.03			
Altruistic condition	4.80	.97			
Biospheric condition	4.69	1.12			
Neutral condition	4.44	1.11			
Intention (M2)			1.53	3, 268	1.05
	<i>M</i>	<i>SD</i>			
Egoistic condition	3.95	1.75			
Altruistic condition	3.86	1.68			
Biospheric condition	3.41	1.94			
Neutral condition	3.48	1.74			

Note. \*  $p < .05$ ; *t* value is for the contrast that hypothesized the differences between the neutral condition vs. egoistic, altruistic and biospheric value framed condition.

<sup>2</sup> When splitting the attitude into ‘edible insects’ and ‘insect products’, the only significant effect that is found is on attitude towards edible insects (M2). The differences in the conditioned messages yielded an *F* ratio of  $F(3, 268) = 2.69, p < .05$ , indicating a significant difference between the value framed conditions: Egoistic value frame ( $M = 4.83, SD = 1.06$ ); Altruistic value frame ( $M = 4.86, SD = .95$ ); Biospheric value frame ( $M = 4.73, SD = 1.13$ ) and the Neutral condition ( $M = 4.40, SD = 1.14$ ). The contrast (comparing the neutral condition with the value framed conditions) revealed that Attitude towards edible insects was significantly different  $t(3, 268) = 2.75, p < .01$ , but the attitude towards insect products showed no significant differences between the conditions.

## 4.5 Matching Hypothesis

In order to answer the sub research question *‘Does value framing create a more effective message, therefore changing the attitude and intention towards entomophagy?’* the following hypothesis was formulated.

H3 A greater change in attitudes and intentions will occur when the message frame aligns with a person’s values. The altruistic and biospheric oriented message will appeal to people with stronger altruistic and biospheric values and the egoistic oriented message will appeal to those with stronger egoistic values.

A factorial ANOVA (4x4) was conducted to test the interaction effects of a person’s value orientation and the value framed message they received on the attitude and intentions towards entomophagy (M2).<sup>3</sup>

The factorial ANOVA showed a statistical significant interaction effect of value orientation and the value framed message on the attitude towards entomophagy,  $F(9, 262) = 2.47, p < .01$  (see Table 14). A main effect is found in the value orientations,  $F(3, 256) = 6.24, p < .001$ , this is also for the value framed message,  $F(3, 256) = 3.75, p < .05$ . As can be seen in Table 13, only the interaction in the egoistic match (egoistic value orientation x egoistic value framed message) results in a significant difference in attitude (M2). For intention (M2) only a significant difference exists for the value orientation,  $F(3, 256) = 3.29, p < .05$ . However, since only 14 respondents were determined in the egoistic value orientation, it is questionable if this is a representative sample size. When the egoistic group is filtered out of the analysis, only a main effect for the value framed message results in a significant difference for attitude  $F(3, 246) = 2.70, p < .05$ .

Adding attitude (M1) into the factorial ANOVA to test the co-variation of this variable, it can be seen that this is a strong predictor for the dependent variable attitude (M2) ( $p < .001$ ) and intention (M2),  $p < .001$ . The covariate significantly predicts the dependent variable (see Table 13). Therefore, a person’s attitude (M2) and intention (M2) are influenced by the covariate

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<sup>3</sup> When splitting attitude into ‘edible insects’ and ‘insect products’, the factorial ANOVA showed a significant difference for the interaction between the value orientations and the conditions for attitude towards edible insect (M2),  $F(9, 262) = 2.134, p < .05$ . But no matching effect was revealed. Also in the attitude towards insect products (M2), the interaction between value orientation and conditions was found  $F(9, 262) = 2.508, p < .01$ . The only match that was visible were the ones of the egoistic value orientation and egoistic value framed message. Also in this case, it is not representative to report this as an important result, because this effect existed in only 4 respondents. Further, in intention towards edible insects and insect products (M2) only main effects were found.



attitude (M1). The covariate decreased the amount of variation accounted for the interaction between value orientation and condition to a marginal effect.

Table 13: Between subjects effects

	<i>df</i>	<i>F</i>	Covariance	<i>df</i>	<i>F</i>
Attitude (M2)					
			Attitude (M1)	1, 255	116.20***
Value orientation	3, 256	6.24***		3, 255	4.36**
Condition	3, 256	3.75*		3, 255	1.14
Value orientation x Condition	9, 256	2.47**		9, 255	1.78†
Intention (M2)					
			Attitude (M1)	1, 255	88.73***
Value orientation	3, 256	3.29*		3, 255	2.06
Condition	3, 256	1.58		3, 255	.152
Value orientation x Condition	9, 256	1.09		9, 255	.804

Note. † $p < .1$  \* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$

Table 14: Means (M) of attitude (M1,2) and intention (M1,2) in value orientation and value framed conditions

		Attitude M1	Attitude M2	Intention M1	Intention M2
Value orientation	Conditioned message	<i>M</i>	<i>M</i>	<i>M</i>	<i>M</i>
Not dominant	Ego	5.08	5.05	4.12	4.52
	Alt	4.39	4.67	3.75	3.72
	Bio	4.46	4.85	3.44	3.48
	Neutral	4.07	3.85	3.18	3.09
EGO	Ego	4.30	4.43	3.08	2.58
	Alt	5.13	4.15	3.67	3.38
	Bio	2.30	1.40	1.00	1.00
	Neutral	3.83	4.25	2.63	3.13
ALT	Ego	4.52	4.66	3.58	3.65
	Alt	4.65	4.78	3.49	3.60
	Bio	4.40	4.86	3.51	3.66
	Neutral	4.55	4.48	3.27	3.17
BIO	Ego	4.60	4.93	4.13	4.20
	Alt	4.90	4.98	4.23	4.25
	Bio	4.28	4.67	3.28	3.27
	Neutral	4.64	4.83	4.18	4.33

## 4.6 Supplementary analysis: TPB

As is hypothesized in chapter 2 and supported by literature, personal norm is found to be a valuable contributor to the TPB, to bridge the gap between the rational behaviour predictor (TPB) and the moral-based behaviour predictor (VBN) (Parker et al., 1995).

Table 15 presents the means, standard deviations and the correlations between the variables of the TPB. The four predictors for behaviour, attitude, subjective norm, perceived

behavioural control and intention. All variables showed a positive significant correlation with each other and with intention.

Table 15: Correlation matrix TPB variables

	<i>M</i>	<i>SD</i>	1	2	3
1. Attitude	4.52	1.06			
2. Subjective Norm	2.91	1.55	.37**		
3. Perceived behavioural control	5.60	1.03	.18**	.23**	
4. Intention	3.62	1.77	.52**	.55**	.18**

Note. \*\*  $p < .01$

From the supplementary research it becomes clear that the TPB explains 42% of the variance in intention towards entomophagy (see Table 16 on the next page). Within this analysis, intention was the dependent variable and the attitude towards the behaviour, SN and the PBC were the independent variables. After subjective norm ( $\beta = .41$ ,  $t(3, 268) = 8.082$ ,  $p < .001$ ) attitude ( $\beta = .37$ ,  $t(4, 268) = 7.392$ ,  $p < .001$ ), is the strongest contributor in the model.

Adding the moral variable (PN) of the VBN to the TPB, the variance is explained for 48% (see Table 15). After subjective norm ( $\beta = .41$ ,  $t(4, 267) = 8.512$ ,  $p < .001$ ) and attitude ( $\beta = .32$ ,  $t(4, 267) = 6.519$ ,  $p < .001$ ), personal norm is a strong contributor to this the model ( $\beta = .25$ ,  $t(4, 267) = 5.546$ ,  $p < .001$ ).

Table 16: Regression analysis of TPB, attitude (M1) and Second regression analysis with PN

DV: Intention (M1)					
	$\beta$	<i>t</i>	$R^2$	<i>df</i>	<i>F</i>
Model 1			.42	3, 268	65.65***
SN	.41	8.08***			
PBC	.02	.50			
Attitude	.37	7.39***			
DV: Intention (M1)					
	$\beta$	<i>t</i>	$R^2$	<i>df</i>	<i>F</i>
Model 1			.48	4, 267	62.40***
PN	.25	5.55***			
SN	.41	8.51***			
PBC	.02	.40			
Attitude	.32	6.52***			

Note. \*  $p < .05$  \*\*  $p < .01$  \*\*\*  $p < .001$

## 5 Discussion and conclusion

Until now there has been relatively little research which has examined the relationship between an individual's value orientation, the attitude and intention towards consuming insects and the effectiveness of information provision about the advantages of edible insects. The aim of the present study was to get a better understanding of how people with predisposing values respond to value framed messages. The results found in the previous chapter and the context of the surrounding literature contains the basis for the discussion below.

### *5.1 Most important results*

To be able to test the hypothesized relation between a person's value orientation and attitude and intention, a person's dominant value orientation was determined. A marginal result indicated that people with a biospheric and altruistic value orientation have a positive intention towards entomophagy, and people with an egoistic value orientation have a negative intention towards entomophagy. When zoomed in onto the results for intention, it becomes visible that the intention towards consuming edible insects is responsible for this marginal effect, not insect products. People with altruistic or biospheric values are statistically significant more likely to consume edible insects instead of insect products in the future, compared to people with an egoistic value orientation. In contrast to the literature (Ajzen, 1991) and expectations, this study did not found indications that the attitude to eat edible insects differ between people with different value orientations. It is remarkably that people intend to eat edible insects in the future, but their attitude does not explicitly say so.

Furthermore, not only a person's value orientation, but also the beliefs on environmental concern and personal norms are successful in explaining the intention and attitude towards entomophagy in the pre-measurement. A person's moral obligation (indicated as personal norm) towards pro-environmental behaviour explained almost 13% of the intention and 5% of the attitude towards entomophagy. Compared to earlier studies, this is a low percentage.<sup>4</sup> In addition, the remaining variables of the VBN Theory confirmed the causal chain. The degree of moral obligation can be explained for 45% by the remaining variables of the VBN Theory. A person's

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<sup>4</sup> Earlier studies that tested the VBN Theory described that about 14% to 35% of the variance is described by personal norm in different contexts, which indicates that the current study found relatively low percentages of explained variance. In the willingness to reduce car use and general pro-environmental behaviour, only 14-20% was explained by personal norms (Bamberg & Schmidt, 2003; Nordlund & Garvill, 2002) and 17% in subway use (Hunecke, Blöbaum, Matthies & Höger, 2001). In recycling behaviour, 35% of the variance is explained by personal norm. In this study, the complete VBN model explained 8% in attitude and 17% in intention towards entomophagy.

moral obligation was explained by the ascription of responsibility. Thereafter, this ascription was explained by the awareness of consequences, which was explained by one's world view regarding pro-environmental behaviour. These results are in line with previous studies (Stern et al., 1999; Hunecke et al., 2001; Nordlund & Garvill, 2003; Schultz & Zelezny, 1999). The perceived responsibility for the problems resulting from eating conventional protein sources was higher among respondents who were aware of these problems. Furthermore, the environmental concern contributed to the explanation of the ascription of responsibility. Finally, respondents with high environmental concern contributed to the awareness of consequences, but was a less strong contributor than the previous variables. The awareness of consequences of a behaviour was found to be the strongest contributor to the model, which implies that those who are aware of the adverse consequences of behaviour to others or the environment, are more likely to consume edible insect products.

As the VBN Theory assumes, a person's value orientation underlies pro-environmental behaviour (Stern, 2000). Evidence for tailoring a person's value by the use of a message as a manner to encourage a desired behaviour, is found in literature (Abrahamse, Steg, Vlek & Rothengatter, 2007; Chong & Druckman, 2007). Therefore, in the current study it was assumed that a person's value orientation could be an avenue for influencing the attitude and intention towards entomophagy.

By providing the respondents with a message about the positive effects of eating edible insects or insect products, it was hypothesized that the attitude and intentions towards this behaviour in the post-measurement would increase. This was done first by comparing the respondents that received a message that appealed to the characteristics of egoistic, altruistic or biospheric values with the respondents that received a neutral condition. As expected, the attitude towards entomophagy was more positive among the respondents that received the conditioned message, compared to the respondents that received the neutral message. Especially the attitude towards edible insects was increased. The attitude towards insect products did not increase. Unexpected was, that there was no difference found in the intention between respondents that received the conditioned or neutral message.

The hypothesized match between value orientation and value framed condition did only show an effect on attitude when a person with an egoistic value orientation received a message that was appealed at the egoistic characteristics. Though, drawing conclusions from this data may not be representative, because there were only 14 respondents with a dominant egoistic value orientation and only 4 of them received the egoistic value framed condition. When filtering the

egoistic group out of the analysis, there were no significant interaction effects between value orientation and the value framed message.

*Supplementary research.* It was found that personal norms are a valuable contributor in the TPB in explaining variance in behaviour (Parker et al, 1995). In the current study, the supplementary research reveals that the Theory of Planned Behaviour's rational variables explain 42% of the variance in intention towards entomophagy and is a stronger predictor than the VBN Theory.<sup>5</sup> In this study it is found that personal norms are a valuable contributor to this model, after the subjective norm and attitude. The perceived ability to consume edible insects was not found to be a predictor in the TPB. The variance in intention towards entomophagy that was explained by adding the personal norm to the TPB, was increased by 6%, a total explanation of 48%.

## 5.2 Theoretical implications

The dominant value orientation was determined by a self-designed measurement tool. It was possible to classify 83.1% of the research population. Only 16.9% of the sample did not show a dominant value orientation.<sup>6</sup> This new and simple measure for identifying individuals' dominant value orientation is a strength of the current study.

From this study, it is found that a person's value orientation is related to the intention towards edible insects, and not towards the attitude. The Theory of Planned Behaviour (Ajzen, 1991) describes attitude as one of the predictors of intention towards certain behaviour. In this study, attitude is measured by questions like "Edible insects are healthy/unhealthy" or "Edible insects are good for the environment/bad for the environment". An explanation of this result could be, that it is possible that the respondents were unable to evaluate the specific characteristics of entomophagy because of lack of knowledge. Intention was measured by asking questions like "In the future it is likely that I will eat edible insects". These kinds of questions are more easy to evaluate by the respondent. The question is not about their knowledge, but these questions make people evaluate how likely it is that they will consume edible insects or insect products in the future.

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<sup>5</sup> This is in line with the meta-analyses that suggest that the theory can predict 39-42% of the variance in intention (Armitage & Conner, 2001; Sheeran & Taylor, 1999).

<sup>6</sup> This percentage is comparable with the achievement goal approach from the literature of Van Yperen (2006) and the dominant social value orientation of Van Lange and colleagues (1997). Van Yperen (2006) was able to determine a dominant profile for 83,8% to 86.4% of the population. Van Lange, De Bruin, Otten and Joireman (1997) were able to classify 79.9% to 88,2% of the research population.

A possible explanation for the phenomenon of low influence of moral obligation on attitude and intention is, that the moral obligation - and more generally - the VBN Theory, seems to differ for different behaviours (e.g. car use, recycling, energy policies and novel foods). Steg et al. (2005) suggests that this may be dependent on how costly (in terms of money, effort and time) the pro-environmental behaviour is. In the current study, this is not taken into account, but it could be that edible insects or insect products are considered as costly behaviour because 1) it takes effort to buy these products in a local supermarket because the availability is not optimal and 2) when they are available, the price is (currently) high compared to a piece of meat. Another thing that can explain the low variance, is that the VBN Theory is developed to explain behaviour that is taken with pro-environmental intent. It may well be that the practice of consuming edible insect products is not considered as pro-environmental behaviour by the respondents.

After the respondents received the value framed message, the attitude towards entomophagy was significantly higher compared to the respondents that received the neutral message. This increase can be explained by the knowledge-deficit theory (Schultz, 2002), which indicated that a person's behaviour will not change until they know how and why they should make a change. In this study, a person's knowledge was not measured. But it can be assumed that one's attitude is derived from knowledge. Based upon this theory, Nolan (2010) indicated that increasing the awareness of a problem can be achieved through information alone. This appears to be the case here, as the effect on attitude towards entomophagy was the strongest result present in the analysis. Through raising concern about an issue, behaviour can change (Minton & Rose, 1997). This change should derive from intention, according to Ajzen (1991). Despite the lack of change in intention towards entomophagy through providing a conditioned message, the intention was not negative. But it could be that the time of the elaboration of the manipulation was too limited to establish a change in intention. Another explanation could be that the information that was provided in the manipulated conditions was too limited. Informing people about the environmental constraints of conventional protein sources, together with the advantages of novel protein sources - like edible insects - could have been an avenue to encourage this more.

The matching hypothesis did not show significant differences. An argument for this phenomenon could be that the value framed messages did not personally appeal to the respondent, because the messages were written in the third person. Another, more conceptual explanation could be that appealing to a person's value orientation is not effective because a person's value orientation is difficult to manipulate. According to the VBN Theory, values are deeply rooted in a person's life (Stern, 2000). In this theory, values are the basis of the causal

chain that predicts behaviour. As the ascription of responsibility and awareness of consequences are found to be strong predictors and more close to behaviour, it may well be that appealing to a person's value orientation is not the most effective manner for changing behaviour. But other links in the causal chain, especially AR and AC, are more interesting to target by means of a message when aiming for a behaviour change. In the current study, personal norms are not very strong predictors of the attitude and intention towards entomophagy, but can be encouraged by the AR and AC beliefs. Therefore, it is questionable if the VBN Theory is entirely applicable to the acceptance of entomophagy.

*Supplementary research.* The Theory of Planned Behaviour did explain a great percentage of the variance in intention towards entomophagy. Especially when the personal norm was added to the model, the predictive power of this theory was enhanced. Personal norm contributed more to the explanation of the variance in intention than the perceived behavioural control did. An explanation for this phenomenon could be that performing the actual behaviour is perceived to be difficult. This because consuming edible insects can be considered as (previously mentioned) 'costly behaviour' in terms of money, effort and time.

Compared to the VBN Theory, the TPB together with the personal norm is more successful in explaining the variance in intention towards entomophagy. The attitude and subjective norm, together with personal norm, seem to be more important for people deciding to perform behaviour regarding entomophagy.

### ***5.3 Practical implications***

This study gives insights in how to make information campaigns that focus on establishing a behaviour change with a pro-environmental perspective more effective. The ways in which information is communicated is important. It is worthwhile to provide information to the public about the advantages of edible insects and insect products, but campaigns should also have the aim to improve the awareness of adverse consequences of eating conventional protein sources.

This research has shown that the attitude can change positively through providing a value framed message, irrespective of what value orientation a person has. The neutral message did not show an effect on attitude or intention. This is in line with what Vermeir and Verbeke (2006) stated. They proposed that clear and straightforward information is important for consumers making purchasing decisions, such as considering edible insects.

For practice, it may be taken into account that people with an altruistic or biospheric value orientation do have a positive intention towards entomophagy. It can be assumed that these kinds of people are more easily to target when aiming for a pro-environmental behaviour change. In the design of messages it also seems promising to focus on the awareness of adverse consequences and ascription of responsibility of consuming conventional protein sources and why people should be more likely to accept edible insects. These beliefs can strengthen the moral obligation according to the VBN Theory. In this study the moral obligation did not seem to be a very strong predictor of the attitude or intention towards entomophagy. However, according to the TPB, the moral obligation can be considered as a strong predictor of the intention.

Further, it seems that the limited availability of edible insects or insect products and their corresponding price are an obstacle for consumers. The effort that has to be overcome to be able to eat edible insects is first to find a supermarket that sells the products. In The Netherlands, insect products can only be found in online shops, in reform shops or in some Jumbo supermarkets. Secondly, the price of these products has wide ranges. Processed insect products can be found from about € 21,-- to € 42,-- per kilo, and the prices of whole insects ranges from approximately € 118,-- to € 194,-- per kilo.<sup>7</sup> Compared to a piece of biological beef that is available in the same supermarket, the prices ranges are about € 25,-- per kilo<sup>8</sup>. Next to the effort of price and availability, it is assumed that Dutch consumers don't have enough knowledge, nor the skills if cooking with insects is concerned, despite the insect cookbooks that are already available on the market. Promotion of these cookbooks can be stimulated, using the current study.

## *5.4 Limitations*

In this study, the data were generated at one point in time. This leads to the first limitation of this experimental study. The limited time between the pre- and post-measurement, where the value framed message was presented to the respondent, does not benefit the elaboration of the experiment. To improve the elaboration of the value framed message, questions about the message were asked, however the manipulation check did show that the egoistic and altruistic value framed messages were not successful in manipulating the respondents. On the other hand, it can be assumed that the biospheric condition was successful in manipulating the respondents.

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<sup>7</sup> The prices are based upon the Insecta vegetable burger with buffaloworms (Jumbo) and Conbuggie products (online), (8-7-2016)

<sup>8</sup> The prices of biological meat are based upon products of Jumbo supermarkets (8-7-2016)



It's possible that this influenced the outcomes. It would be a recommendation for further research to design the research in a way that it is possible to take measurements at another point in time, thus to enhance the elaboration of the manipulation.

Furthermore, in this study - by determining a person's value orientation - it was impossible to add the three value orientations as variables in the regression analyses with the other VBN Theory variables. This limits the insights in how a value orientation is related to the other variables in the causal chain of the VBN Theory.

A possible explanation for the unexpected low influence of moral obligation on attitude and intention towards entomophagy from the VBN theory, is that the formulation of the questions in the questionnaire were not adequate. The questions about the moral obligation and environmental beliefs did not include aspects of the specific behaviour (consuming insects). The items in the questions were about the impact of food production and consumption on the environment. According to Steg et al. (2005), the predictive power of the VBN Theory may be enhanced if the questions about beliefs and moral obligation are formulated towards the specific behaviour to be explained. This makes the causal chain a more specific tool and less general.

The results of this research showed limited differences between 'edible insects' and 'insect products'. However, literature describes that this is an important distinction to make (Tan et al., 2015). This event can be explained, because perhaps respondents did not have enough imagination of what to think of with regard to these two products. In the questionnaire, the difference was explained by showing images only once. Perhaps it would have been helpful for the respondents, when a question was asked about edible insects or insect products, that an image was shown to point out the differences between the two products more clearly.

Further, some limitations are described to the characteristics of the research sample. The completion rate of the survey was almost 71%. This may indicate that the survey was too challenging for respondents (in time, number of questions or the formulation of questions). Indirectly, this can also mean that the respondents that completed the questionnaire lost focus while answering the last questions. There is no evidence for this occurrence, but this indicates that the findings of this study should be interpreted with care.

Another limitation of the research is, that there were only 14 respondents determined with an egoistic value orientation. One could assume that only 5.1% Dutch inhabitants do pursue egoistic values. But it could also be the case, that contrasting egoistic values to altruistic or biospheric values, a socially desired answer is easier to give. Although, there is no evidence for this assumption. This circumstance could also be associated with the high percentage of women

(Eisenberg & Fabes, 1998) that filled in the questionnaire or the high level of education that the respondents achieved.

### *5.5 Future directions*

The results of this thesis provide a good starting point for further research into how values influence the acceptance of novel foods (like edible insects). Studying the acceptance of novel foods by means of the VBN Theory is possibly one of the first times this was done in The Netherlands. It is the question to what extent people's behaviour can be manipulated. However, we can conclude that a better elaboration of the manipulation material makes a greater chance in establishing changes in attitude, intention or even behaviour.

As found in the results, people with experience in eating edible insects or insect products do have a more positive attitude and intention towards the practice of eating insects. A suggestion is to expand this research by spreading the design over time. First a person's dominant value orientation is measured with the self designed Dominant Value Orientation Approach. At the same time, the components of the VBN Theory are measured together with attitudes and intentions. It would also be interesting to randomly assign the respondents to one of the value framed messages at the same point in time and invite them to an insect-eating session that takes place on a later point in time. This session enables measuring the attitudes to different kinds of edible insects and insect products in real life and at the same time, measuring the intention to consume insects. To emphasize the value framing effect, it would be interesting to recommend several insect dishes with value framed content, preferably the same frame that the respondent did get during the value framed message. Afterwards, the respondents are asked to fill in a short questionnaire with - again - questions about their attitudes and intentions towards edible insects and insects. The pre-measure will indicate what the attitudes and intentions of a respondent are. During the session, the attitude and intention can be measured with observations, interviews or focus groups. A post-measure can be done by a questionnaire. This research ensures that the respondents are exposed for several times to the properties of entomophagy. It is assumed that this enhances the elaboration of the manipulation. It is expected that the attitude and intention will be more positive among all respondents.

Another more realistic recommendation for future research, is testing and improving the Dominant Value Orientation Approach. The high percentage that was achieved in determining a respondents' dominant value orientation in this study, can be considered as indicative of the possible viability of the Dominant Value Orientation Approach. It is recommended to examine, whether individuals with different dominant value orientations can be characterized by distinct

patterns of value-relevant variables. Like for egoistic persons, whether they are concerned with their own wealth; for altruistic people, whether they are concerned with the wellbeing of others; and for the biospheric persons whether they think the nature is valuable. For example a test that is useful to examine what individuals themselves perceive as their most important value orientation (Van Yperen, 2006). It is also recommended to develop a standard to map the dominant value orientation together with the other VBN concepts. This makes it possible to see the relations between the dominant value orientation and the VBN concepts that are omitted from the regression analysis.

## 5.6 Conclusion

The main aim was to identify whether a message, framed in alignment with pre-existing value orientations would affect attitudes and intentions towards consuming insects. This was undertaken to get a better understanding of how pro-environmental behaviour could be encouraged. Through the use of an online survey tool, a quantitative study was undertaken to detect differences in outcomes among various (non)experimental groups. The general research question that was formulated was: *“How does value framing affect people’s attitude and intention towards entomophagy in The Netherlands?”*

This research did not find effects on attitude and intention by means of targeting people with a pre-existing value orientation with specific value framed information. But the results of this study did indicate that the acceptance of edible insects may be enhanced by providing an egoistic, altruistic or biospheric framed message, instead of only neutral information. By means of the VBN Theory, it is proposed that by influencing the awareness of consequences and the ascription of responsibility, the moral obligation will be increased and form a causal chain towards the attitude of consuming edible insects. The TPB supports the importance of the moral obligation in explaining behaviour regarding entomophagy.

Furthermore, this research provided a new, simple and promising approach for determining a person’s dominant value orientation.

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## Appendices

### A - Questionnaire In Dutch

Beste deelnemer, Eerst wil ik u bedanken dat u wilt deelnemen aan dit onderzoek. Met deze vragenlijst worden gegevens verzameld voor mijn Masterscriptie aan Wageningen Universiteit. Het onderzoek gaat over het maken van bepaalde voedselkeuzes.

Als dank verloot ik 5 VVV-cadeaubonnen van €10,- onder de deelnemers. De vragenlijst zal ongeveer 15 minuten duren. Ik zou het erg fijn vinden als u de vragen aandachtig leest en de vragenlijst in zijn geheel invult. Alleen deelnemers die de vragenlijst volledig invullen kunnen meedoen aan de loting van de VVV-cadeaubonnen.

De vragenlijst is anoniem, er wordt zorgvuldig met uw antwoorden omgegaan. Het geheel aan ontvangen gegevens uit de ingevulde vragenlijsten wordt geanalyseerd, dit wil zeggen dat individuele antwoorden niet worden uitgelicht.

Als u nog vragen heeft of graag aanvullende informatie wilt ontvangen over dit onderzoeksproject, neemt u dan contact op met [simone.leijdekkers@wur.nl](mailto:simone.leijdekkers@wur.nl). Alvast hartelijk bedankt!

Met vriendelijke groet,  
Simone Leijdekkers

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Onderstaande informatie is van belang om de vragen goed te kunnen beantwoorden. In de vragen die gesteld worden zal af en toe gesproken worden over het eten van insecten. Als het gaat om eetbare insecten dan zijn deze insecten veilig voor consumptie en worden deze niet levend geconsumeerd. Bij eetbare insecten kunt u denken aan insecten in zijn geheel bereid, en nog herkenbaar als insect. Ook kunt u denken aan insectenproducten zoals insectenburgers, -nuggets of -schnitzels. Hierin zijn de insecten zo verwerkt dat ze niet meer te herkennen zijn. In deze vragenlijst worden beide termen 'eetbare insecten' en 'insectenproducten' gebruikt.



Afbeelding 1: Eetbare insecten



Afbeelding 2: Insectenproducten

Hieronder volgen de eerste vragen.

Q1 Hoe zou u uw eetpatroon rondom het eten van vlees omschrijven? (Vlees als broodbeleg of als snack telt ook)

- ☐ Ik eet elke dag vlees
- ☐ Ik laat tot drie keer per week vlees weg uit mijn voeding
- ☐ Ik laat vaker dan drie keer per week vlees weg uit mijn voeding
- ☐ Ik eet geen vlees

Q2 Heeft u wel eens bewust eetbare insecten of insectenproducten gegeten?

- ☐ Ja, eetbare insecten
- ☐ Ja, insectenproducten
- ☐ Ja, beiden
- ☐ Nee, nog nooit

De volgende vragen gaan niet specifiek over voedselkeuzes, maar zijn voor dit onderzoek van belang om voedselkeuzes te begrijpen.

Q3.1 Hierbij wil ik nogmaals benadrukken dat uw antwoorden volledig anoniem zijn. Het is echt van belang dat u bij het maken van de afweging nadenkt over wat belangrijk is in uw leven, en niet bijvoorbeeld wat u denkt dat anderen van u verwachten. Er volgen nu 9 afwegingen, kies steeds de uitspraak die u het beste bij uzelf vindt passen. In mijn leven vind ik het belangrijk om...

- ☐ ...leiding te kunnen nemen of opdrachten te geven
- ☐ ...gelijke kansen te hebben voor iedereen

Q3.2 In mijn leven vind ik het belangrijk om...

- ☐ ...ongelijkheid tegen te gaan en te zorgen voor zwakkeren
- ☐ ...de aarde te respecteren en in harmonie te leven met andere soorten

Q3.3 In mijn leven vind ik het belangrijk om...

- ☐ ...het milieu te beschermen en de natuur te behouden
- ☐ ...controle over anderen te hebben

Q3.3 In mijn leven vind ik het belangrijk om...

- ☐ ...controle over anderen te hebben
- ☐ ...te werken voor het welzijn van anderen

Q3.4 In mijn leven vind ik het belangrijk om...

- ☐ ...te werken voor het welzijn van anderen
- ☐ ...materiële bezittingen en geld te hebben

Q3.5 In mijn leven vind ik het belangrijk om...

- ☐ ...vervuiling van het milieu te voorkomen
- ☐ ...ongelijkheid tegen te gaan en te zorgen voor zwakkeren

Q3.6 In mijn leven vind ik het belangrijk om...

- ☐ ...materiële bezittingen en geld te hebben
- ☐ ...vervuiling van het milieu te voorkomen

Q3.7 In mijn leven vind ik het belangrijk om...

- ☐ ...gelijke kansen te hebben voor iedereen
- ☐ ...het milieu te beschermen en de natuur te behouden

Q3.8 In mijn leven vind ik het belangrijk om...

- ☐ ...de aarde te respecteren en in harmonie te leven met andere soorten
- ☐ ...leiding te kunnen nemen of opdrachten te geven

Q4 In hoeverre bent u het eens of oneens met onderstaande uitspraken. Dierlijk eiwit = rundvlees, varkensvlees, kip of vis.

		Helemaal mee oneens	Mee oneens	Beetje mee oneens	Niet mee oneens / Niet mee eens	Beetje mee eens	Mee eens	Helemaal mee eens
Q4.1	De opwarming van de aarde is een probleem voor de samenleving	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q4.2	Duurzame voedselkeuzes helpen de opwarming van de aarde te verminderen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q4.3	De groeiende vraag naar dierlijk eiwit is een probleem	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q4.4	De impact van de consumptie van dierlijk eiwit op het milieu is een probleem	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q4.5	De kwaliteit van het milieu zal verbeteren als we minder dierlijk eiwit consumeren	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q4.6	Het is niet zeker of de opwarming van de aarde een echt probleem is	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q5 In hoeverre bent u het eens of oneens met onderstaande uitspraken? Dierlijk eiwit = rundvlees, varkensvlees, kip of vis.

		Helemaal mee oneens	Mee oneens	Beetje mee oneens	Niet mee oneens / Niet mee eens	Beetje mee eens	Mee eens	Helemaal mee eens
Q5.1	Ik ben mede verantwoordelijk voor de opwarming van de aarde	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q5.2	Ik voel me mede verantwoordelijk voor de grote vraag naar dierlijke eiwitten	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q5.3	Ik voel me mede verantwoordelijk voor de onzekerheid over het hebben van	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	voldoende gezond voedsel in andere landen							
Q5.4	Mijn bijdrage aan het probleem van de opwarming van de aarde is verwaarloosbaar	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q5.5	Niet alleen de overheid en de vlees- en visindustrie zijn verantwoordelijk voor de grote impact op het milieu, maar ik ook	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q5.6	In principe kunnen individuen zelf geen invloed uitoefenen op het verminderen van de opwarming van de aarde	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Q6 In hoeverre bent u het eens of oneens met onderstaande uitspraken?**

		Helemaal mee oneens	Mee oneens	Beetje mee oneens	Niet mee oneens / Niet mee eens	Beetje mee eens	Mee eens	Helemaal mee eens
Q6.1	We naderen de grens van het aantal mensen dat op de aarde kan leven	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q6.2	Mensen hebben het recht om de natuurlijke omgeving aan te passen aan hun behoefte	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q6.3	Wanneer mensen zich bemoeien met de natuur heeft dit vaak rampzalige gevolgen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q6.4	Menselijke vindingrijkheid zal ervoor zorgen dat we de aarde leefbaar houden	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q6.5	Mensen zijn het milieu ernstig aan het misbruiken	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q6.6	De aarde heeft onuitputtelijk veel natuurlijke hulpbronnen als we maar leren hoe we ze kunnen ontwikkelen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q6.7	Planten en dieren hebben net zoveel recht als mensen om te bestaan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q6.8	De veerkracht van de natuur is sterk genoeg	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	om te kunnen omgaan met de impact van de moderne industrie							
Q6.9	Ondanks onze speciale vaardigheden zijn mensen nog steeds onderworpen aan de wet van de natuur	○	○	○	○	○	○	○
Q6.10	De zogenaamde “ecologische crisis” waarmee de mensheid geconfronteerd wordt, is sterk overdreven	○	○	○	○	○	○	○
Q6.11	De aarde is als een ruimteschip met zeer beperkte ruimte en hulpbronnen	○	○	○	○	○	○	○
Q6.12	Mensen horen te heersen over de rest van de natuur	○	○	○	○	○	○	○
Q6.13	De balans van de natuur is erg kwetsbaar en gemakkelijk te verstoren	○	○	○	○	○	○	○
Q6.14	Mensen zullen uiteindelijk genoeg leren over hoe de natuur werkt, om in staat te zijn deze te besturen	○	○	○	○	○	○	○
Q6.15	Als de dingen doorgaan op hun huidige koers, zullen we snel een grote ecologische ramp ervaren	○	○	○	○	○	○	○

Q7 In hoeverre bent u het eens of oneens met onderstaande uitspraken?

		Helemaal mee oneens	Mee oneens	Beetje mee oneens	Niet mee oneens / Niet mee eens	Beetje mee eens	Mee eens	Helemaal mee eens
Q7.1	Ik voel me persoonlijk verplicht om zo milieuvriendelijk en duurzaam mogelijk te eten	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q7.2	Ik voel me moreel verplicht om zo milieuvriendelijk en duurzaam mogelijk te eten, los van wat anderen doen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q7.3	Ik voel me schuldig als ik voedsel verspil	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q7.4	Ik voel me moreel verplicht om milieuvriendelijke en duurzame voedselproducten te kopen in plaats van 'gewone' producten	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q7.5	Mensen als ik zouden er alles aan moeten doen om zo milieuvriendelijk en duurzaam mogelijke producten te eten	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q7.6	Als ik voedsel koop, voel ik me moreel verplicht om zo milieuvriendelijk en duurzaam mogelijke producten te kopen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q7.7	Ik voel me totaal niet schuldig bij het kopen van groente en fruit uit verre landen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q7.8	Ik voel me persoonlijk verplicht om de natuur en het milieu in gedachten te houden in mijn dagelijks leven	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q7.9	Ik zou een beter persoon zijn als ik milieuvriendelijk en duurzame voedselproducten zou consumeren	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

De volgende vragen gaan onder andere over het eten van eetbare insecten en/of insectenproducten. Per vraag kan dit verschillen, lees de vragen daarom aandachtig.

Q8 In hoeverre bent u het eens of oneens met onderstaande uitspraken?

		Helemaal mee oneens	Mee oneens	Beetje mee oneens	Niet mee oneens / Niet mee eens	Beetje mee eens	Mee eens	Helemaal mee eens
Q8.1	Mensen die belangrijk voor mij zijn zouden het afkeuren als ik eetbare insecten of insectenproducten zou eten	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q8.2	Bij mensen zoals ik zou het eten van eetbare insecten of insectenproducten niet passen binnen de leefstijl	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q8.3	Ik kan zelf over mijn eigen voeding beslissen in de toekomst als het gaat om het eten van eetbare insecten of insectenproducten	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q8.4	Het is mijn beslissing of ik eetbare insecten of insectenproducten eet of niet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q8.5	Ik denk dat het moeilijk is om eetbare insecten of insectenproducten te eten in de toekomst	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q8.6	Als ik wil kan ik op elk moment eetbare insecten of insectenproducten eten	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q9 Nu volgen er een aantal vragen over eetbare insecten. Geeft u aan op een schaal van 1 tot 7: Het eten van eetbare insecten is...

		1	2	3	4	5	6	7
Q9.1	Heel erg gezond:Heel erg ongezond	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q9.2	Heel erg plezierig:Heel erg onplezierig	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q9.3	Heel erg goed voor het milieu:Heel slecht voor het milieu	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q9.4	Heel erg nuttig:Heel erg onnuttig	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q9.5	Heel goed ter vervanging van vlees of vis:Heel slecht ter vervanging van vlees of vis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Q10 Volgende vragen gaan over insectenproducten. Geef u aan op een schaal van 1 tot 7: Het eten van insectenproducten is...

		1	2	3	4	5	6	7
Q10.1	Heel erg gezond:Heel erg ongezond	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q10.2	Heel erg plezierig:Heel erg onplezierig	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q10.3	Heel erg goed voor het milieu:Heel erg slecht voor het milieu	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q10.4	Heel erg nuttig:Heel erg onnuttig	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q10.5	Heel goed ter vervanging van vlees of vis:Heel slecht ter vervanging van vlees of vis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

De volgende vragen gaan over de inschatting van uw toekomstige voedselkeuzes met betrekking tot het eten van insecten of insectenproducten.

Q11 In hoeverre zijn onderstaande uitspraken voor u van toepassing met betrekking tot eetbare insecten?

		Helemaal niet van toepassing	Niet van toepassing	Waarschijnlijk niet van toepassing	Niet van toepassing / Wel van toepassing	Waarschijnlijk wel van toepassing	Wel van toepassing	Helemaal van toepassing
Q11.1	In de toekomst is de kans groot dat ik eetbare insecten ga eten	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q11.2	Ik ben van plan om eetbare insecten te proberen komend jaar	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q11.3	Het is mijn voornemen om in de toekomst eetbare insecten in mijn voedingspatroon op te nemen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q12 In hoeverre zijn onderstaande uitspraken voor u van toepassing met betrekking tot insectenproducten?

		Helemaal niet van toepassing	Niet van toepassing	Waarschijnlijk niet van toepassing	Niet van toepassing / Wel van toepassing	Waarschijnlijk wel van toepassing	Wel van toepassing	Helemaal van toepassing
Q12.1	In de toekomst is de kans groot dat ik insectenproducten ga eten	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q12.2	Ik ben van plan om insectenproducten te proberen komend jaar	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q12.3	Het is mijn	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	voornemen om in de toekomst insectenproducten in mijn voedingspatroon op te nemen							
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Nu volgt een informatieve boodschap. Na het lezen van dit bericht worden er vragen over het bericht gesteld. Het is daarom van belang dat u dit goed en aandachtig leest.

*(respondent wordt random toegewezen aan één van de vier condities)*

*[niet getoond aan respondent: Bericht dat is geformuleerd o.b.v. de kenmerken van de egoïstische waardeoriëntatie]*

"In Nederland wordt er gemiddeld zo'n 76 kg vlees per persoon per jaar gegeten. Deze overmatige vleesconsumptie is niet van deze tijd. Er zijn alternatieven waarmee je kunt laten zien dat je een vernieuwend en vooruitstrevend persoon bent op het gebied van eiwitrijke voedingsmiddelen. Zo is de markt van eetbare insecten relatief nieuw op het gebied van hoogwaardige eiwitten en ontwikkelt zich in een rap tempo. In Westerse landen zijn eetbare insecten en insectenproducten momenteel steeds populairder aan het worden en vormen een nieuwe voedseltrend. Door deze ontwikkeling bij te houden, dien je als voorbeeld voor je sociale omgeving. De voedingswaarden van eetbare insecten zijn vergelijkbaar of zelfs hoger dan die van een stukje vlees. De hoge kwaliteit zorgt ervoor dat de producten tot het luxesegment behoren, met de daarbij behorende hogere productprijs. Insectenproducten zijn nog niet overal verkrijgbaar en dus exclusief. Deze hoogwaardige eigenschappen van eetbare insecten en insectenproducten dragen dan ook bij aan een positief persoonlijk imago."

*[niet getoond aan respondent: Bericht dat is geformuleerd o.b.v. de kenmerken van de altruïstische waardeoriëntatie]*

"Gemiddeld wordt er in Nederland zo'n 76 kg vlees per persoon per jaar gegeten. Wereldwijd stijgt de vraag naar dierlijke eiwitten naarmate economieën en de wereldpopulatie groeien. In de toekomst kan dit leiden tot een tekort aan dierlijke eiwitten. Ieder persoon heeft recht op voldoende veilige en gezonde voeding. Het is daarom van belang om op zoek te gaan naar nieuwe alternatieven om een eerlijke verdeling van dierlijke eiwitten na te streven. Eetbare insecten zijn zo'n alternatief. Ze zijn erg voedzaam en gezond voor de mens, sommige soorten zelfs vergelijkbaar met vlees. Door in Westerse landen vlees gedeeltelijk te vervangen door eetbare insecten en insectenproducten, kunnen we helpen de wereldwijde voedselschaarste tegen te gaan. Er komen daardoor meer gezonde eiwitten beschikbaar voor een groot gedeelte van de wereldbevolking. Juist in Westerse landen hebben we de mogelijkheden om nieuwe eiwitten te produceren en te consumeren om dat hier veel geld en techniek voor nodig is."

*[niet getoond aan respondent: Bericht dat is geformuleerd o.b.v. de kenmerken van de biosferische waardeoriëntatie]*

"Gemiddeld wordt er in Nederland zo'n 76 kg vlees per persoon per jaar gegeten. De productie van vlees is belastend voor het milieu, en daarmee heeft dat negatieve gevolgen voor de balans van het ecosysteem en behoud van de natuur. Het is een feit dat vlees- en zuivelketens voor bijna 20% verantwoordelijk zijn voor het broeikaseffect, en 8% van het waterverbruik. Het eten van minder vlees kan bijdragen aan een afname van de vervuiling van het milieu. Met een milieuvriendelijk alternatief kunnen we het broeikaseffect en haar gevolgen voor het ecosysteem tegengaan. Eetbare

insecten zijn een goed alternatief voor vlees. Sommige soorten zijn net zo voedzaam als vlees maar veel minder belastend voor het milieu. Insecten worden duurzamer geproduceerd, zo heeft rundvlees 10 kilo voer nodig voor 1 kilo vlees, daar heb je 9 kilo insectenvlees voor. Zodoende is de keuze voor insecten respectvoller voor aarde dan de consumptie van andere dierlijke eiwitten."

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*[niet getoond aan respondent: Neutraal bericht dat is geformuleerd zonder toevoeging van een van de kenmerken van de waardeoriëntaties]*

"Gemiddeld wordt er in Nederland zo'n 76 kg vlees per persoon per jaar gegeten. De wereldwijde vleesconsumptie stijgt nog altijd. Dit komt onder andere door de groeiende economieën in landen waar vlees aanvankelijk geen hoofdingrediënt was in het dagelijkse voedingspatroon. Tegenwoordig zijn er nieuwe alternatieven, er worden in Westerse landen bijvoorbeeld eetbare insecten aangeboden ter vervanging van vlees. Bij het eten van eetbare insecten kun je denken aan het eten van de eitjes, larven of poppen van een insectsoort. Het volwassen insect wordt zelden gegeten vanwege de lagere voedingswaarde en de harde buitenkant die onprettig te eten is en slecht te verteren. Verschillende soorten insecten worden al sinds de prehistorie gegeten door de mens. Ook in huidige culturen zijn insecten een onderdeel van de dagelijkse menselijke voeding. Steeds vaker zien we ook dat de insecten verwerkt worden tot insectenburger, -nugget of -schnitzel, ook in Nederland."

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Q13 Waar ging het bericht over dat u zojuist gelezen heeft?

- ☐ Over de smaak van eetbare insecten als voedsel
- ☐ Over het aantal calorieën van eetbare insecten en insectenproducten
- ☐ Over de voordelen van eetbare insecten en insectenproducten
- ☐ Over op wat voor manier insecten gegeten kunnen worden
- ☐

Q14 Volgens het bericht, zijn eetbare insecten en insectenproducten een positieve of een negatieve ontwikkeling?

- ☐ Positief
- ☐ Negatief
- ☐ Neutraal

Q15 Volgens het bericht, welke voordelen van het eten van insecten of insectenproducten zijn belangrijk?

- ☐ Het eten van insecten helpt bij het verminderen van milieuvervuiling
- ☐ Het eten van insecten draagt bij aan een positief persoonlijk imago
- ☐ Het eten van insecten helpt bij het eerlijker verdelen van dierlijke eiwitten over de wereldbevolking
- ☐ Geen van deze voordelen zijn genoemd in het bericht

Q16 Volgens het bericht, welke onderdelen zijn belangrijk bij het accepteren van eetbare insecten of insectenproducten?

- ☐ Het nastreven van sociale rechtvaardigheid, behulpzaam zijn en het belang van gelijkheid op de wereld
- ☐ Dat eitjes, larven of poppen van een insectsoort gegeten kunnen worden.
- ☐ Het behoud van natuur, het voorkomen van vervuiling en het respecteren van de aarde
- ☐ Vooruitstrevend zijn, het hebben van financiële middelen en het dienen als voorbeeldfunctie

Q17 Volgens het bericht, in hoeverre kloppen onderstaande stellingen wel of niet?

		Klopt helemaal niet	Klopt niet	Klopt misschien niet	Klopt niet / Klopt wel	Klopt misschien wel	Klopt wel	Klopt helemaal
Q17.1	Het eten van eetbare insecten en insectenproducten is goed voor je persoonlijke imago	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q17.2	Door eetbare insecten of insectenproducten te eten streef je gelijkheid van de voedselverdeling op de wereld na	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q17.3	Het consumeren van eetbare insecten en insectenproducten laat zien dat je kapitaalkrchtig bent (rijk)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q17.4	Het eten van eetbare insecten en insectenproducten is goed voor de bescherming van het milieu	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q17.5	Het consumeren van eetbare insecten en insectenproducten laat zien dat je behulpzaam bent	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q17.6	Door eetbare insecten of insectenproducten te consumeren kun je vervuiling van het milieu voorkomen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q17.7	Het eten van eetbare insecten en insectenproducten draagt bij aan gelijke kansen voor iedereen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q17.8	Door eetbare insecten of insectenproducten te eten ben je een invloedrijk persoon	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q17.9	Het consumeren van eetbare insecten en insectenproducten laat zien dat je respect hebt voor de aarde	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q18 In hoeverre bent u het eens of oneens met onderstaande uitspraken met betrekking tot eetbare insecten?

		Helemaal mee oneens	Mee oneens	Beetje mee oneens	Niet mee oneens / Niet mee eens	Beetje mee eens	Mee eens	Helemaal mee eens
Q18.1	Het eten van eetbare insecten is goed voor het milieu	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q18.2	Het eten van eetbare insecten is gezond	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q18.3	Het eten van eetbare insecten is plezierig	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q18.4	Het eten van eetbare insecten is goed ter vervanging van rundvlees, varkensvlees, kip of vis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q18.5	Het eten van eetbare insecten is in algemene zin nuttig	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q19 In hoeverre bent u het eens of oneens met onderstaande uitspraken met betrekking tot insectenproducten?

		Helemaal mee oneens	Mee oneens	Beetje mee oneens	Niet mee oneens / Niet mee eens	Beetje mee eens	Mee eens	Helemaal mee eens
Q19.1	Het eten van insectenproducten is goed voor het milieu	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q19.2	Het eten van insectenproducten is gezond	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q19.3	Het eten van insectenproducten is plezierig	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q19.4	Het eten van insectenproducten is goed ter vervanging van rundvlees, varkensvlees, kip of vis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q19.5	Het eten van insectenproducten is	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	in algemene zin nuttig							
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De volgende vragen gaan over de inschatting van uw toekomstige voedselkeuzes met betrekking tot het eten van insecten of insectenproducten.

Q20 In hoeverre gelden onderstaande uitspraken voor u met betrekking tot eetbare insecten?

		Zeker niet	Niet	Waarschijnlijk niet	Neutraal	Waarschijnlijk wel	Wel	Zeker wel
Q20.1	Komend jaar wil ik eetbare insecten proberen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q20.2	In de toekomst wil ik eetbare insecten gaan eten	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q20.3	In de toekomst wil ik eetbare insecten gebruiken ter vervanging van vlees	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q21 In hoeverre gelden onderstaande uitspraken voor u met betrekking tot insectenproducten?

		Zeker niet	Niet	Waarschijnlijk niet	Neutraal	Waarschijnlijk wel	Wel	Zeker wel
Q21.1	Komend jaar wil ik insectenproducten proberen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q21.2	In de toekomst wil ik insectenproducten gaan eten	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q21.3	In de toekomst wil ik insectenproducten gebruiken ter vervanging van vlees	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Hieronder volgen de laatste vragen voor dit onderzoek.

Q22 Via welke weg bent u bij deze vragenlijst terecht gekomen?

- ☐ Huis-aan-huis blad
- ☐ Social media (zoals Facebook, Twitter of LinkedIn)
- ☐ Anders, namelijk \_\_\_\_\_

Q23 Wat is uw geslacht?

- ☐ Man
- ☐ Vrouw

Q24 Wat is uw leeftijd?

Q25 Wat is uw hoogst genoten onderwijsniveau?

- ☐ Basisschool
- ☐ Middelbare school (MAVO, HAVO, VWO)
- ☐ Middelbaar beroepsonderwijs (MBO)
- ☐ Hoger beroepsonderwijs (HBO)
- ☐ Universitair (WO)

Q26 Wat zijn de 4 cijfers van uw postcode?

Q27 In welk land bent u opgegroeid?

- ☐ Nederland
- ☐ Een ander land in Europa
- ☐ Anders, namelijk \_\_\_\_\_

Dit was de laatste vraag van het onderzoek. Ik wil u hartelijk bedanken voor uw deelname. Voor vragen of opmerkingen kunt u een e-mail sturen naar [simone.leijdekkers@wur.nl](mailto:simone.leijdekkers@wur.nl).

Als u kans wilt maken op één van de vijf VVV-cadeaubonnen van €10,- vult u hieronder uw e-mail adres in. Zodra de loting heeft plaatsgevonden, wordt er contact opgenomen met de winnaars.

Door op het pijltje te drukken worden uw antwoorden opgeslagen.