

# Not just a Matter of Taste - Disgust in the Food Domain

by

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A dissertation submitted to BI Norwegian School of Management  
for the Degree of Dr.Oecon

Series of Dissertations 1/2005

**BI Norwegian School of Management**

Department of Marketing

Elin Kubberød:  
*Not just a Matter of Taste-  
Disgust in the Food Domain*

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2005

Series of Dissertations 1/2005

ISBN: 82 7042 654 7  
ISSN: 1502-2099

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Phone: +47 67 55 70 00

Printing: Nordberg Hurtigtrykk

**To be ordered from:**

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Fax: +47 67 55 74 50  
Mail: [bi.sandvika@norli.no](mailto:bi.sandvika@norli.no)

## **Abstract**

Higher competition in the market arena is forcing marketers and product developers to monitor and adjust the impact of their product in the marketplace more rapidly. Furthermore, in rapidly changing markets it is not sufficient to only consider utilitarian aspects of consumption, but also to examine the more hedonic or aesthetic aspects. Marketing success is largely determined to the extent that consumers are having a positive emotional experience, and when unappealing attributes and cues that can motivate negative feelings such as disgust are minimised.

Being the ultimate consumable products, food and eating represent a highly relevant arena for subjectivity and emotional response during consumption. Meat and meat products are particularly vulnerable products with respect to negative product emotions, in as much as food from animal origin and negative product emotions like disgust seem to be closely related.

Recent findings have often pointed to avoidance of and emotional resentment with particularly red meat among young females in the western, industrialised world. A market surveillance study of meat consumption in Norway confirms a growing distrust in the Norwegian meat industry and scepticism towards meat consumption in the female segment. This segment may represent a “critical potential” for future meat consumption since women still occupy the main positions as decision makers with respect to food planning. This segment is also of special interest in this dissertation.

This thesis focuses on the negative product emotion of disgust generated by meat and meat consumption experiences. This research intends to increase the knowledge about the antecedents of disgust, in order for managers in the meat industries to be able to tailor the presentation, communication and product development of animal derived foods for critical and sensitive consumer segments.

The overall research objective of this dissertation has been to gain insight into the negative product emotion of disgust targeted to meat, with emphasis on the nature of the stimuli attributes, the personal influences and individual differences in emotional response. The approach resulted in four cross sectional studies in the Norwegian population. Hypothesis has been developed and overall, we have found general support for the proposed hypotheses. More specifically we have:

- addressed the experiential aspects of meat consumption and demonstrated the relevance of one particular negative product emotion within food consumption and consumer behaviour.
- devoted considerably attention to the understanding of the sensory and symbolic eliciting properties, the personal concerns, individual differences in emotional responses, as well as to facets of the emotional response itself.
- demonstrated disgust with meat as a relevant mediator in the prediction of red meat consumption.
- focused on the use of senses, direct experience, actual stimuli, as well as recalled experience to assess consumers' emotional responses to food products and demonstrated the value of acknowledging both the cognitive and sensory-affective dimensions of the consumer response system to products.
- given special focus to the basis for the consumer evaluation process and offered direct implications for managerial manipulations.
- conceptualised and operationalised three components of "animality" and hopefully, contributed to the disgust theory itself.
- found that personality, experience, age, and gender are key to the understanding of differences in disgust with animal derived foods. The finding that, among females negative associations were based on disgust in contrast to the distaste associations found among males, should also represent an important contribution to the understanding of individual differences in disgust. The relevance of disgust sensitivity in conjunction with display of "animality" may also be a finding of value for both research and practice.
- introduced sensory analysis into research in marketing.

This thesis was accomplished during the period from September 1998 until December 2004 (in-between two maternity leaves).

## Acknowledgements

At the time of completing this dissertation there are many people to be acknowledged and thanked for this project coming to an end. I have enjoyed great support, inspiration, help and friendship from many good colleagues, friends and family.

First of all, I would like to thank my advisor at BI Norwegian School of Management Dr. Inge Jan Henjesand for accepting me as his doctoral student and believing in my project and ideas. He has been a great support and a stimulating discussion partner, as well as being a very considerate and easy-going person. Inge Jan has given me valuable tutoring in the different stages of the research process, but his involvement in the very final stages of the write up of this thesis has been invaluable.

Next, I would like to thank my advisors at Matforsk, Dr. Einar Risvik and Dr. Øydis Ueland. Einar is gratefully acknowledged for giving me initial ideas for the research topic in this dissertation and for always believing in me. Einar has been an indispensable discussion partner at every stage of this process. I appreciate his intellectual inspiration, as well as the kind and caring person he is. Dr. Øydis Ueland has also been an important advisor in this research project. As the project leader for the consumer research programme at Matforsk she has had a great and positive influence on my research. Øydis has spent a lot of time helping me, and providing constructive comments on practically every aspect of the research. My everlasting gratitude goes to her for being the most co-operative, and supportive person involved in my research. Thanks also for being a very good friend.

Sincere thanks go to my considerate boss, Kari Clausen for providing the best working conditions for me and for believing in me and this new research area at Matforsk. I am very grateful to Kari for her decision to employ me as a researcher and include me in her department.

In addition, I would like to show my gratitude to my co-authors besides my supervisors, Senior Sensory Scientist Marit Rødbotten, Dr. Gunvor Dingstad, Dr. Frank Westad, and former student Åsne Tronstad. Thank you all for co-operating, discussing and helping me with the preparation of the papers. Thanks go to Professor Tormod Næs who has been a stimulating conversation partner and helpful in the early stages of my doctoral training at Matforsk. Thanks go to Bengt Lorentsen for introducing me to LISREL. I

am also very grateful to Margrethe Hersleth, Professor Luk Warlop Professor Magni Martens, Dr. Øyvind Langsrud, Dr. Bjørn-Helge Mevik, Per Lea, Dr. Even Lanseng, and Ellen Tronrud, whom have reviewed earlier versions of my manuscripts and given me constructive and valuable advices.

The sensory panel and the associated engineers deserve as well great thanks Particularly, I would like to thank Inger-Johanne Fjøsne, Aud Espedal, Laura Blümlein and the sensory panel manager Asgeir Nilsen for valuable practical assistance.

Silje E. Lund at the doctoral office at Norwegian School of Management BI is thanked for her service minded attitude. She has always been friendly and helpful whenever I needed her assistance.

Thanks go to the service providers at Matforsk, especially Lily Rømcke for her valuable assistance in submitting my papers and for always being a very positive and service-minded person. Special thanks also go to Aud Midtgarden in the library for her ongoing effort to always provide me with my requests regarding literature. Thanks also to Kjell Merok for excellent and professional work with pictures for the last study.

My gratitude goes to my colleges and friends I have good collaborations and recreating conversations with at Matforsk.

The grant from the Fund for the Research Levy on Agricultural Products and Matforsk, which financially enabled me to work on this dissertation, are gratefully acknowledged. BI Norwegian School of Management is thanked for accepting me as doctoral student and providing me with excellent academic and advisory resources. My humble thanks are extended to my doctoral committee, consisting of chairman Professor Fred Selnes, first opponent Professor Klaus G. Grunert, and second opponent Professor Sigurd V. Troye.

Last, but not least, I will thank my family and friends for all the good times we spend together. Special thanks and gratitude go to my parents for always being there for me and my family. I also owe tremendous thanks to my husband Øyvind who has always supported me, and been understanding and patient during these years. Finally my deepest love goes to my precious children Einar and Iver, two beautiful boys, whom make me realise what is most important in my life.

Elin Kubberød  
Ås, January 2005

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This thesis focuses on the negative product emotion of disgust generated by meat and meat consumption experiences. This research intends to increase the knowledge about the antecedents of disgust. This knowledge would also benefit the managers in the meat industries enabling them to tailor the presentation, communication and product development of animal derived foods for critical consumer segments.

### **Why study disgust?**

Research has shown that emotions have a strong influence on our general experience of well being (Diener and Lucas, 2000), play a significant role in many consumption experiences, and are often found to influence behaviours (Hirschman, 1999). Consumption products can elicit positive and negative emotions. Intuitively, people approach the products they like and avoid the products they don't like. Mostly, positive consumer evaluations have been studied, e.g. those aspects that lead to consumer satisfaction and choice. However, if we look at it from another perspective, what people like to consume is often a result of what they avoid. In the search to understand why something is appealing or pleasurable, it is equally important to study why a product is rejected. What we do not want to consume is after all as personally and socially important as what we desire. For example, food objects that are undesirable are found to be correlated stronger with social variables than are "food loves" (Englis and Solomon, 1997).

A product that is experienced as unappealing can offend our senses and produce the emotion of *disgust* (Desmet, 2003a). Disgust means in simple terms something offensive to the taste (Darwin, 1872/1965). The disgust associated with particular product interactions reflects the cultural environment in which the consumers are participants (Mela, 2000; Rozin, 1989), thus such negative emotional responses to a product represent a manifestation of the modern culture of consumption itself. Consumption in the western, modern society is no longer assumed to only satisfy basic physiological needs, but is more and more seen as a goal of hedonic pleasure in itself (Holbrook, 1996), as well as a means for building individual and collective identities (Holt, 1995). According to Holt (1995), consumption practices may represent a universe on how people interact with consumption objects in the materialised society. Consumption can be seen as lived experiences that may be organised according to the structure of consumption (directly engaging or as interpersonal resources) as well as the purpose of consumption (instrumental versus autotelic). One of Holt's (1995) categories, consuming as experience, particularly values the subjective and emotional dimensions arising from consumption itself.

There is also a managerial and more commercial reason for this dissertation. Higher competition in the market arena is forcing marketers and product developers to monitor and adjust the impact of their product in the marketplace more rapidly. Furthermore, in rapidly changing markets it is not sufficient to only consider utilitarian aspects of consumption, but also to examine the aspects related to consumption itself, e.g. what it feels like to interact with the product (Addis and Holbrook, 2001). In fact, for many consumption objects consumers have limited access to product interactions before buying the product. During different consumption stages, consumers acquire subjective and hedonic experiences, upon which their future consumption choices will be influenced. Advertisement and communication of a product, through its packaging, and presentation seek to create an image around the consumption object into which consumers can fit themselves. This presentation created by marketing managers is highly related to the product's appeal.

Marketing success is therefore largely determined to the extent to which consumers are having a positive emotional experience and to the point where unappealing attributes and cues that can motivate negative feelings such as disgust are minimised. The potential *disgust provoking attributes* associated with a product and the negative emotional reactions to it represent barriers to consumption. Given that the impressions of a product strongly influence purchase decisions and consumption, the knowledge about how products come to evoke disgust should be considered valuable information for the product developers and marketers. Such insight would make it easier to comply with critical tastes of consumers and increase the appeal of products.

### **Object of study**

Meat is the topic of this dissertation, in as much as food from animal origin and disgust seem to be closely related (Rozin and Fallon, 1987). Other food stimuli from animal origin such as fish (see Olsen, Olsen and Honkanen (2003)) may also be of relevance for studying this emotion, but these are out of the scope of this dissertation.

According to Hirschman and Holbrook, (1982), Levy (1959), and Rozin (1999) food products have relevance with respect to emotional responses. First, food choice is sensitive to symbolic influences, which are attached to the social and cultural meaning of food. Second, consumption of foods is a very subjective, sensory stimulating experience and provides opportunities for emotional responses. Thirdly, consumption of foods affects our health, wellbeing and appearance, and the responses to foods are very private in nature. Food and eating are therefore examples of experiential consumption especially rich in cultural and personal meanings (Bourdieu, 1984; Lupton, 1996), and associated with powerful emotions (Rozin, Haidt, McCauley, and Imada, 1997). Foods might also be referred to as the ultimate consumable objects, in that they are literally incorporated by the consumers (Lupton, 1996). Moreover, food is an essential component of daily routines and is the focus of a major share of consumption behaviours in our lives (Shimp and Stuart, 2004).

Recent findings have often pointed to avoidance of and emotional resentment with red meat, in particular among young females in the western, industrialised world (Gregory, 1997; Kenyon and Barker, 1998; Mooney and Walbourn, 2001; Santos and Booth, 1996; Worsley and Skrzypiec, 1996; Worsley and Skrzypiec, 1997; Worsley and Skrzypiec, 1998; Wright and Howcroft, 1992). Furthermore, the female segment has showed to be relevant as a target population being particularly sensitive to experience disgust (Haidt, McCauley, and Rozin, 1994). A market surveillance study of meat consumption in Norway confirms a growing distrust among consumers with the Norwegian meat industry and scepticism within the female segment towards meat consumption (Lien, Bjørkum, and Bye, 1998). This segment may represent a “critical potential” for future meat consumption since women still occupy the main position as decision makers with respect to food planning (Lien et al., 1998). The female segment is of special interest in this dissertation since it may also represent a marketing challenge for the meat industries.

### **Disgust in theory**

Theoreticians like Izard (1977) and Plutchik (1980) have asserted that there exist a few fundamental and basic emotions, disgust being one of them. Disgust is an important emotion in everyday life, and it is realised when consumers think of or experience unpleasant situations. Disgust means literally “bad taste”, and the first definition in the history of disgust was probably the one put forward by Darwin from *The Expression of the Emotions in Man and Animals* (Darwin, 1872/1965). Darwin defined disgust

as “something revolting, primarily in relation to the sense of taste, as actually perceived or vividly imagined, and to anything which causes a similar feeling through the senses of smell, touch and even eyesight”. Angyal (1941) interpreted disgust as a reaction to unwanted intimacy, focusing on bodily incorporation, with the mouth as the central focus. He identified through self- and other-observation that certain substances were found to be repulsive (such as faeces, waste from humans and animals, urine and so on). He further proposed that it was basically the idea or meaning attached to such items that evoked the repulsion in disgust. Lazarus (1991) defined the core theme in disgust to be “taking in or being close to an indigestible object or idea (metaphorically speaking)”. Tomkins (1963) further argued that the purpose of disgust is “to defend the self against psychic incorporation or any increase in intimacy with a repellent object”. As such, the meaning and elicitors of disgust are defined within the culture and depend on the conception of an essence that exists independent of physical qualities (Rozin et al, 1997).

Within experimental psychology, Paul Rozin and colleagues are pioneers in researching the nature and origin of disgust. Building on Angyal (1941), Rozin and Fallon (1987) and Rozin et al. (1997) proposed a Theory of Disgust and defined disgust as “a food-related emotion which is characterised by a revulsion at the prospect of oral incorporation of an offensive and contaminating object”.

Disgust in the food domain is named *core disgust* and includes animals and their products when considered as food. With respect to food and eating, there is among humans a widespread aversion to different animals as consumption products, though the focus on disgust may vary from culture to culture (Rozin, 1989). Angyal (1941) proposed that all disgusting items are animal derived products, which is further confirmed through the contributions of Rozin and his colleagues (Fallon and Rozin, 1983; Haidt et al., 1994; Rozin and Fallon, 1980). Opposed to Rozin, who has emphasised the food and animal-related concept of disgust, Miller (1997) has claimed that disgust is above all a moral emotion. According to Rozin et al. (1997), some disgust elicitors (like moral offences) do not fit into the category of animal disgust, but rather these elicitors have developed from core disgusts and expanded to interpersonal and moral disgusts, and thus represent evolutionary steps of core disgust.

Emotions serve as instruments to pulling us towards or pushing us away from objects or situations (Frijda, 1986). According to Haidt, et al. (1994) the emotion of disgust protects us against recognition of our animality, and maybe mortality, and functions to maintain the line between humans and

animals. According to Nabi (1999), more than fear and anger, disgust is based significantly on learned cultural practice. The learning of disgust is fully internalised at the age of eight (Rozin and Fallon, 1987).

### **Disgust in the marketing literature**

The theoretical models and empirical investigations from the last two decades have established emotions as a legitimate area for research in the field of marketing (Huang, 2001), and the emotional responses have served as important variables in the study of consumer behaviour (Cohen and Areni, 1991).

The focus of this dissertation, disgust, represents a rather unexplored area in marketing (Shimp and Stuart, 2004), and it is within advertising that this emotion has received most attention. According to Nabi (1999), a notable amount of research on negative emotions elicited by media messages has focused on the effect of fear appeals and the emotion of fear, but the persuasive effects of anger, sadness and disgust have largely been ignored. Nabi's (1999) conceptual paper developed a series of propositions with respect to these negative emotions. For instance, in order for a negative emotion to have an influence, it must be shown that a persuasive message can elicit these emotions, and "such messages should therefore incorporate an emotional core relational theme as it is likely to be perceived by a target population". However, advertising research on disgust as a single emotion is rather scant, the recent study by Shimp and Stuart (2004) on food-related disgust being the only known exception. In their research they looked at advertising of food (meat in fast food advertising) and the role that disgust in response to food advertising plays in mediating the effect of advertising content on purchase intentions, with focus on the stimuli attributes themselves. They tested the hypothesis that the uncooked, raw meat included in advertising for a sandwich from a fast-food restaurant would lead to unfavourable evaluations with respect to the restaurant (feelings of disgust with the food and negative intentions to visit and eat at the restaurant), a hypothesis that was confirmed both for beef and chicken.

Earlier, Batra and Ray (1986) reviewed the typology literature on primary emotions and identified disgust as one relevant affective response in the advertising context, but only positive affective responses were operationalised for empirical testing in this paper. Holbrook and Batra (1987) also considered disgust as an emotion relevant for advertising. They particularly acknowledged the nature of advertising attributes in eliciting emotional responses to ads. Holbrook and Batra's (1987) study conceptualised several feeling facets of disgust such as "disgusted",

“revolted”, “annoyed” and “full of loathing”. Furthermore, real TV-commercials were used as emotional stimuli and, more important, they managed to demonstrate that the emotions elicited by the ads were linked to specific content factors that could be describing the ads. Despite this, the study did not explore the effect of disgust per se, because disgust, along with other emotions, was aggregated to composite emotional components. This study thus failed to establish a direct link between specific product attributes (ad content attributes) and the target emotion of disgust. Allen, Machleit, and Marine (1988), used Izard’s (1977) classical framework of emotion typologies to allow consumers to report the occurrence of emotions, disgust included, commonly elicited by advertising (based on recalled experiences).

Outside advertising, Havlena and Holbrook (1986) and Westbrook (1987) have applied established typologies from the psychological literature to measure between eight and ten emotions from consumption experiences, including disgust. These experiences were based on written descriptions of situations and recalled experiences, respectively. In Havlena and Holbrook (1986) three indices for disgust (“disgusted”, “offended”, “unpleasant”) were presented for subjects in the rating of artificial experiences related to goods and services. Disgust was shown to be negatively correlated with acceptance. In Westbrook (1987) disgust was included in a composite predictor (along with anger and contempt) to measure the effect on post-purchase satisfaction, complaining, and word-of mouth behaviours; thus the single effect of disgust per se was not investigated. Machleit, Eroglu, and Mantel (2000) tested if disgust along with anger and contempt mediated the effect of crowded shopping environment on perceived shopping satisfaction. They found that disgust was positively and significantly correlated with perceptions of crowding. The review article by Richins (1997) identified disgust as relevant, but not key in consumption situations; but the article’s main scope was to review emotion measurement rather than to look into particular emotions per se. However, according to Shimp and Stuart (2004) this emotion may in the modern and future society become probably more pervasive in daily consumption than has previously been acknowledged.

After the literature reviewed, the impression is that many studies have been mainly occupied with and focused on the validity and reliability of different emotional typologies adopted from mainstream psychology and their applications to the domain of consumption experiences and advertising. Furthermore, we can infer from the literature found that disgust has not received much attention as a single emotion, nor has it been much addressed in conjunction with specific consumption products like foods. Even though addressed conceptually, there exist few research attempts focusing on the

content or nature of stimuli and how they are capable of eliciting single, negative emotions like disgust.

### **Boundaries of study**

Given the concept of emotion and consumption as a broad and rather intangible research area, some boundaries have to be established. The following subchapters will elaborate upon the boundaries for this dissertation.

### **One product emotion versus multiple emotions**

A distinction is made between studying a broad variety of emotions versus one particular emotion. Many researchers have investigated how multiple emotions are generated by the use of specific products (Holbrook, Chestnut, Oliva, and Greenleaf, 1984; Mehrabian and Wixen, 1986), by favourite possessions (Schultz, Kleine, and Kernan, 1889), by services (Oliver, 1994), or in a variety of consumption situations (Derbaix and Pham, 1991; Havlena and Holbrook, 1986; Richins, McKeage, and Najjar, 1992). However, Richins (1997) has questioned the relevance of all of these multiple emotions evoked from products. Primary and targeted emotions like disgust are rarely seen in their pure forms in the marketing literature. In this dissertation the intention is to explore the particular emotion of disgust targeted to meat.

### **Disgust as a food related emotion versus an aesthetic emotion**

From a historical perspective, the concept of disgust seems to arise from food consumption (Rozin, Haidt, and McCauley, 2000). Angyal (1941) described disgust as an avoidance of oral incorporation of certain products, with the mouth as the critical focus. Rozin and Fallon (1987) argued that the oral incorporation refers directly to the eating experience. Plutchik (1980) treated disgust as “getting rid of something harmful that has already been incorporated”. The characteristic facial expression of disgust (see Ekman and Friesen (1975)) is the functional manifestation of the rejection of undesirable foods, thus representing an argument for the food origin of disgust. Furthermore, Rozin and Fallon (1987) argue that the very distinctive reaction of disgust is nausea, which can be regarded as a functional physiological response that inhibits further eating. Rozin et al. (1997) argued that disgust developed from a primitive mechanism for rejection of distasteful food products (a functional bodily system protecting the body from eating poisonous foods) into a uniquely human and cultural emotion protecting the human soul.

In the cognitive perspective of emotion, disgust has been considered as an attraction emotion with negative valence attributed to objects and aspect of objects (Ortony et al., 1988). Disgust can therefore be defined as a product emotion (Desmet, 2003a) because it arises when people react to unappealing product characteristics (Ortony, Clore, and Allan, 1988).

Contrary to Rozin and his colleagues, some theorists have defined disgust more in general terms, such as Miller (1997) who referred to disgust as a moral and social emotion regulating all kinds of behaviours. According to Miller (1997), Immanuel Kant in his “Critique of judgement” (Kant, 1790/1987) defined the “pure taste” as the aesthetic capacity of rejection and avoidance, a “disgust” for all that is facile; thus disgust can also be seen as the pure aesthetic taste (Miller, 1997). Therefore, disgust has also been defined as an aesthetic emotion responsible for offending our senses (Desmet, 2003a). Since disgust is defined as an aesthetic emotion in the design literature, it has often been attributed to characteristics of product design and aspects such as style (Desmet, 2003a, 2003b; Jones, 2000). Tomkins (1963) argued that the “critical similarity upon which disgust is learned and generalised is a deviation of the object from any norm, the good and the beautiful”. This assumption can consequently lead to “an endless variety of objects as capable of evoking disgust”. In this perspective, anything that we encounter in our interaction with the environment can disgust us, such as a tv commercial or a car in a car-shop, things that in the aesthetic perspective depart from the beautiful (Boyzman and Sabini, 2001).

The approach to disgust studied in the dissertation will adopt the food-related conceptualisation of this emotion. Since we are dealing with food and eating, this definition is therefore not only limited to visual experience, but also to other sensory modalities and bodily consequences from eating (Rozin and Fallon, 1987).



### **Interaction as a basic premise for disgust**

Every purchase or consumption event invokes an interaction between a subject and an outside stimulus. The product embodies certain objective features, while the consumer embodies a personality equipped for sensitivity to various sources of subjective responses (Addis and Holbrook, 2001). Thus for disgust to occur one is therefore dependent on some sort of subject-object interaction related to both directly or recalled (memorised) experiences. In the case of food related disgust this would apply to interactions as touch, sight, smell, and taste, given the fact that the stimulus is going to be literally consumed. The presumption that the food stimulus is going to be consumed is therefore a necessary condition in order to study the effect of stimuli attributes on disgust response.

### **Multi-sensory experience versus just visual experience**

The sensory attributes of food products are critical determinants of consumer response and product success. The judgements consumers make are based on the perceived attributes of products.

In marketing and consumer behaviour the focus has been typically products, brands, logos, symbols, ads, packaging, price etc., with limited focus on sensory taste and smell attributes (Garber, Hyatt, and Starr, 2003). With regard to product design, vision has been the primary sense of importance in evaluations (Bloch, 1995; Bloch, Brunel, and Arnold, 2003; Crilly et al., 2004). Sensory research seems unique in that it also has focus on other senses such as smell and taste. In that way, sensory science is one branch of psychophysics, with a stronger focus on multivariate relationships involving all the senses in evaluation (Martens, 1999).

The experiential consumption perspective is referring to and encouraging research on the aspect of consumer behaviour that relates to actual perception of products through multi-sensory modalities (Hirschman and Holbrook, 1982; Holbrook and Hirschman, 1982). In this dissertation we will rely on vision, taste, and smell to study emotional responses.

## **Multi-methodological approach to product stimuli**

The field of consumer behaviour has often been occupied with product attributes that have been described verbally (Holbrook and Hirschman, 1982). One has furthermore often relied on cognitive (recalled) representations of product interactions in the testing of affective dimensions, without the products actually being experienced by consumers (perceived in the psychophysical sense) (Grunert, 2003; van Trijp and Schifferstein, 1995). In responses to aesthetic designs and brands, picture stimuli have been commonly applied (see e.g Bloch et al. (2003) and Desmet (2002) for examples). This dissertation adopts a multi-methodological approach to product stimuli, in that it considers in addition to recalled experiences, verbal, pictorial, and real product stimuli.

## **The conceptual framework**

This dissertation intends to provide an integrated conceptual framework for the consumer emotional response system to food products. With this unified attempt, it is hoped that complementary theories presented from different areas will be drawn together.

The traditional view on consumer behaviour has presented consumer product responses as comprising *cognition* and *affect* followed by *behaviour* (Howard and Sheth, 1969). These aspects comprise the consumer response system. Numerous researchers have borrowed and modified this classical C-A-B paradigm (Holbrook, 1986). Even the version on consumer emotional response systems within experiential consumption has employed this approach to position the model on the hedonic and aesthetic nature of consumption (Holbrook and Hirschman, 1982). The departure for the research in this dissertation will also acknowledge this traditional paradigm.

More generally, this approach can be cast into a stimulus-organism-response system (S-O-R), where S denotes the stimulus and can encompass everything that is external to a person (Jacoby, 2002). The organismic variable (O) refers to internal processes between the external stimulus (S) and the final actions or responses emitted (R). This intervening or mediating process (O) can consist of “perceptual, physiological, feeling and thinking activities” (Bagozzi, 1986). Finally the response (R), can according to Bagozzi (1986), be defined as the outcome, the final action toward (approach

or avoidance), or reaction of, consumers with respect to the stimulus. These responses can include both behavioural as well as psychological (emotional) reactions. In psychophysics and sensory science one is typically interested in the relationship between the stimulus and the response. Psychophysics is a branch of experimental psychology (Moskowitz, 2002), and is commonly defined as the “quantitative branch of the study of perception, examining the relations between the observed stimuli (S) and responses (R) and the reasons for those relations” (Martens et al., 2000). The single most important development in this field was the view that the human being can be looked upon as a measurement instrument (Moskowitz, 2002), yielding results as experiences, judgements and hedonic responses (Martens et al., 2000). Consumer behaviour also has emerged from the S-R perspective rooted in behaviourism, but in contrast to the S-R models the field has devoted considerable attention to the internal (O), and particularly the cognitive, organismic factors (Jacoby, 2002; Østergaard and Jantzen, 2000).

There has long been a debate about the causality between affect and cognition in the response system. Empirical studies have shown that affective responses can be triggered without any evaluative processing at all (Zajonc, 1984; Zajonc and Markus, 1991), and this implies that cognition may not even be necessary for the formation of affective responses. On the other hand, Lazarus (1991) and Ortony et al. (1988) have asserted that emotions occur as a result of the cognitive appraisals. To sidestep the controversy between Zajonc and the cognitive perspective on emotions, we acknowledge that some sort of cognitive process generally precedes an emotional reaction, because the cognitions can be activated and operate at a more subconscious, or even unconscious level (Bargh, 2002). We also think that from a practical and managerial perspective, the cognitive models have the advantage of identifying the personal concerns of relevance for emotional phenomena and that these concerns can have predictive capability. In this dissertation we will acknowledge both views by studying the cognitive appraisals from recalled experiences explicitly when products are not present (paper 2) as well as direct emotional reactions to real product stimuli (papers 3 and 4), acknowledging cognition to be implicit. This is also in line with Ortony et al. (1988), postulating that such cognitive representations may be looked upon as an implicit structure and that people behave as if there were such representations.

The framework for the dissertation is presented in Figure 1.1 and the constituent parts will be discussed subsequently.

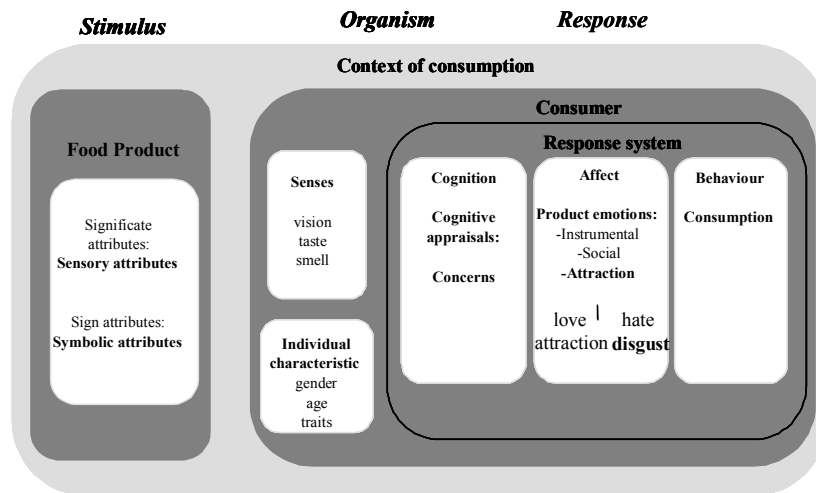


Figure 1.1. The conceptual framework of the dissertation.

### The food product – elicitors of disgust

Food and eating are highly sensitive to symbolic influences and are embedded in the culture of consumption. As such, the meaning associated with a food product itself and particularly with meat eating has been documented in cultural studies (Adams, 1990; Bourdieu, 1984; Fiddes, 1991; Fürst, 1994; Lupton, 1996). A meat product therefore embodies characteristics of symbolic nature or meaning. These *sign* characteristics can be defined as symbolic units that designate the stimulus, and refer to the subjective interpretations that are embedded within culture (Holbrook, 1986). Symbolic properties can also be referred to as gestalt properties (distinctive wholes) and cannot be evaluated attribute by attribute, but are experienced in a holistic and integrated manner (Hirshman, 1983).

Disgust is aroused by things that are organically or psychologically spoiled, for example certain foods, body products, certain sexual behaviours, decaying material, dead bodies, and moral offences (Nabi, 1999; Rozin, Haidt, and McCauley, 2000).

How is the domain of elicitors then structured? To start with a simple distinction, disgust seems to operate in the organic world. Inorganic items are never disgusting, unless they remind us of something organic (Miller, 1997). Furthermore, plants are seldom disgusting compared to animal stimuli. It is not until the plant starts to rot that it can be potentially disgusting, due to revolting smells, sliminess and associations to death and decay (similar features found in the animal kingdom). At some basic level,

the symbolic notion of animality has been thought to be a necessary and sufficient condition for food-related disgust (Rozin and Fallon, 1987). Generally, animality applies to animals themselves and body products from animals (Lazarus, 1991; Rozin, Haidt, and McCauley, 2000).

The distance from humans seems to be very critical. According to Tambiah (1969) food items very close to human kind or very far from a person is commonly rejected. Foods from primates, pets or other cute animals are commonly rejected because they are emotionally close or similar to humans. Organs, distinctive body parts or blood from animal origins may also be rejected because of the idea of being similar in form to their human counterparts. Distanced and hence rejected foods can apply to insects, snakes, frogs, and worms, which are very different in form, compared to humans.

According to Rozin and Fallon (1987) an animal food is at some level disgust provoking due to its animality. Rozin and colleagues claim that any display of animality, serving to reveal and remind us of our own animal origin, is an occasion for disgust to occur (Rozin et al., 2000). This is based upon the assumption that humans take on the properties of what they eat, and in contrast to plants animals seem to have more of the salient characteristics that also can be expressed in humans. Animality is therefore violating the abstract idea of establishing a qualitative difference between animals and humans (Rozin and Fallon, 1987; Tambiah, 1969). According to Miller (1997) the disgust for animals is like a mirror: the animals that disgust us do not disgust us as animals, but because they have gestalt characteristics that are similar to our own.

Distance from humans is clearly related to disgust, but it seems unable to account for the full range of disgust provoking stimuli. Spoiled and decayed objects also seem to operate frequently as disgust elicitors in the organic and animal world. According to this argument food from a) animals that are thought to be decayed or polluted themselves b) animals that consume decayed material such as rats c) animal carnivores feasting on other animals or even worse humans, may elicit disgust. Douglas (1966) claimed in her cultural discussion of the concept of pollution that the human psyche is offended by things that do not fit into accepted schemas- that are polluted or anomalous. Furthermore, many religious meat prohibitions are related to such thinking; for instance that the animal must be vegetarian to be eaten (Miller, 1997). For many people eating particular meats may furthermore be morally wrong (for religious or ideological reasons), for example some consumers are semi-vegetarians and are disgusted by and avoid red meats (Gregory, 1997).

To summarise, we believe that this discussion may account for many disgust provoking stimuli in the animal food domain, but not all. Even though the notion of general animality has been discussed with respect to taboos of animal food (e.g. Angyal, 1941; Fiddes, 1991; Guzman and Kjørnes, 1998; Leach, 1964; Rozin and Fallon 1987; Tambiah, 1969), these aspects have not previously been tested. We will in this dissertation concentrate on the symbolic aspects of animality that humans and animals have in common.

Two propositions can be derived from the above discussion:

- 1. Food stimuli of animal origin elicit symbolic and subjective associations that exist beyond the significate product characteristics.***
- 2. Food stimuli of animal origin embody symbolic, sign aspects that at some level are disgust provoking.***

The first proposition will be addressed in the first, qualitative paper, where we look into the meanings of meat among younger consumers in Norway.

The second proposition will be addressed in paper 4, where the aim is to conceptualise and manipulate high and low levels of symbolic elicitors related to animality and measure their influence on disgust.

A meat product may also be characterised by its sensory or physical attributes such as colour, flavour, texture and smell (Lawless and Heymann, 1998). Holbrook (1986) has named such attributes *significate* characteristics. In the case of food stimuli sensory attributes can be decomposed into flavour, odour, and texture properties, but those are again composed of multiple and complex sensory structures that are experienced in an integrated and unique way (Risvik, 2001).

Sensory perceptions of potentially offensive items of animal nature may additionally be critical for disgust (Rozin and Fallon, 1987). Disgusting items are considered most undesirable when in the mouth, and disgust can be realised through sensory perceptions such as notable texture and strong flavours (Rozin and Fallon, 1987). Food that is presented or experienced in a manner that makes it “look or taste wrong”, by having unexpected or unfamiliar colour, texture or taste might create negative reactions in the consumer, and will be perceived as inedible (Lupton, 1996). Rozin and Fallon (1980) revealed that disgusting items are negatively loaded on sensory attributes like taste/flavours, texture and smell. Consumer studies on

meat have shown that sensory attributes may play an important role in negative food responses (Gregory, 1997). The sensory factors associated with particularly red meat are also dominant on the priority list of reasons for rejection (Santos and Booth, 1996; Kenyon and Barker, 1998).

The third proposition can be derived with respect to sensory attributes from animal products:

3. ***Food stimuli of animal origin having distinctive or notable sensory characteristics are more disgust provoking compared to animal stimuli with less pronounced sensory properties.***

This proposition will be addressed in paper 1 and 3, where we look into the role of sensory attributes in disgust.

### **The senses**

Food products are perceived through the senses. Perception is an active construct, in that it refers to the use of senses in becoming aware of a stimulus and its qualities from sensations that are caused, and the interpretation of those sensations based on previous experience (Lawless and Heymann, 1998). The signal transmitted by the product is received by the physiological senses. The physical stimulus (e.g., a food attribute) stimulates the taste sense. This event is transduced in the receptor cell, conducted by afferent nerves, and results in neural activity in the brain. The raw output from the sensory system is called “perceived sensation” with the relationship between the physical stimulus and the “perceived sensation”, referred to as the “psychophysical function” (Frijters, 1993). In the encoding process, the coupling of the “perceived sensation” to cognitive information yields an internal representation, the mental treatment of the stimulus which can be denoted as the *perception* (Meilgaard, 1991). The complexity of the perceptual system will not be pursued further, since it is not of primary interest in this dissertation.

Within the experiential perspective of consumer behaviour it has been underlined that consumers respond to sensory stimuli as integrated characteristics that can generate other internal images within the consumers (Hirschman, 1983; Hirschman and Holbrook, 1982). This means that perceiving sensory attributes can cause the consumer to generate other internal images related to both past experience and other imagery ideas. The smell of raw meat can for example lead the consumers to imagine animal slaughter and blood.

## **Cognition – Cognitive appraisals to disgust**

Cognitive theorists of emotion argue that the emotions are invoked due to an evaluation, or *appraisal*, (Lazarus, 1991; Ortony et al., 1988) and the proposition that certain appraisals are relevant as antecedents to emotions is commonly accepted (Nyer, 1997). The appraisal is the non-intellectual automatic judgement of the meaning of the situation, e.g. an evaluation of the significance of a stimulus for the person's well being (Lazarus, 1991; Roseman and Smith, 2001). If the encounter with an object is being appraised as undesirable or unappealing relative to our well being, then negative emotions like disgust will occur; and the opposite is true for positive emotions (Lazarus, 1991).

Behind every emotion are hidden the personal concerns, which can be regarded as the point of reference in the appraisal process (Frijda, 1986). In light of this argument outlined here, it is possible to predict an emotion if one has gained insight into the underlying concerns that are relevant for one particular product (Desmet, 2003b).

Researchers in the cognitive tradition of emotion assume that particular emotions are associated with particular types of appraisals, and consequently the emotion can be predicted from the nature of the underlying appraisal (Lazarus, 1991; Nyer, 1997; Roseman and Smith, 2001). Each appraisal type addresses a distinct evaluative matter and is then useful in the classification of different product emotions (Desmet, 2003a).

Products are mostly bought or used with a purpose. Sometimes we buy or interact with a product because we have some interest in its ability to satisfy our primary interests or goals. In this way the products can be regarded as instrumental, as they can be thought to help us to achieve our goals (Ortony et al., 1988). Within the field of consumer behaviour the commonly used approach has been to assume that consumption is constructed by the attributes of the product, in that the product can yield specific benefits for the consumer (Westbrook, 1987), typically referred to as “instrumental behaviour” (McReynolds, 1971; Staw, 1976). In this view the extrinsic rewards associated with such behaviour do not arise from the actual consumption experience itself, but the consumption can be appraised as *desirable* in terms of its ability to accomplish certain interests and goals of the consumer. The primary concerns central for this type of appraisal are goals, and the belonging emotions are typically satisfaction, disappointment, joy, and distress, and can be referred to as instrumental emotions (Ortony et al., 1988).



As products are physical objects, they look and taste in a particular way. These perceivable attributes attached to a product can both *delight* and *offend* us. Appraisal related to appealingness results in *attraction emotions* like love and attraction, and appraisal of unappealingness results in attraction emotions like hate and disgust. According to Ortony et al. (1988), the unpleasantness or unappealingness in the appraisal of a disgusting object is ultimately rooted in dispositional “tastes” or “distastes”, respectively. The authors refer to “tastes” and “distastes” as being everything from innate tastes, such as the disliking of bitter, to more complex gustatory tastes. The dispositional “distastes” consist of acquired attitudes resulting from historical experiences with objects of the same kind or related objects.

The concerns underlying disgust can furthermore be classified into three types of motivations in relation to disgust as a food related emotion (Rozin and Fallon, 1987). According to Lazarus (1991: 260), these three motivations together constitute the cognitive appraisals in the formation of disgust. Since disgust can be evoked by these three concerns, it is considered the strongest form of food rejection (Rozin et al., 1997). What these cognitions in the appraisals may encompass of specific concerns is culturally determined (Rozin, 1989).

The first and primary reason refers to ideational concerns or thoughts (related to what the item is, its history, or where it comes from, e.g. meat comes from flesh and a living animal that has been slaughtered). We understand these concerns or motivations to be dealing with the food’s tendency to be rejected based on the subject’s associations/thoughts attached to the food, or to aspects about the food. We like to think of this type of concern to be related to “backwards” thinking, i.e., the food’s nature in itself is a potent source for reflecting backwards to what the food is or what has happened to the food. Batsell and Brown (1998) have emphasised such cognitive processes as particularly relevant for disgust and aversion to foods.

The second concern relates to undesirable sensory- affective properties such as texture, smell or taste (bad tasting concerns). These aspects resemble Ortony et al.’s (1988) conceptualisations of the dispositional “distastes” with certain aspects of the stimuli.

The last concern addressed by Rozin and Fallon (1987) is anticipation of negative consequences (“forward thinking”), e.g., what we have learned that are the negative and sometimes harmful effects from eating a food. In this latter case this means that for instance meat can be rejected basically because of concerns about consequences from digesting it, such as risk of gaining weight, illness, or feeling of fullness/satiety after consumption (Rozin,

1989). This last aspect or concern is not addressed elsewhere in theory and seems to be unique in its conceptualisation (Rozin, 1989).

In this dissertation we will make an attempt to give these cognitive appraisals content among young females. Based on the discussion of motivations for disgust the following proposition can be outlined:

***4. Ideational concerns, sensory affective concerns and concerns related to negative consequence from eating are central in the appraisal of unappealingness of food stimuli of animal origin and can motivate disgust.***

The fourth proposition will be addressed in papers 1, 2, and 3. In the first paper the aim is to achieve a better contextual understanding of the motivations for disgust with meat. In papers 2 and 3 these concerns will be tested on their influence on emotional response related to disgust.

### **Affect – disgust as product emotional response**

We now turn to the destination for the cognitive appraisals, the product emotional response. The psychological experiences that follow the interpretation and appraisal of the product, e.g the emotional response to it (through perception), is according to Hirshman and Holbrook (1982) the essence of the consumption experience. The term *affect* is normally used as an umbrella term to encompass emotions, feelings, drives, moods and so on. Affect is constituted of mental phenomena that are consciously and subjectively experienced (Westbrook, 1987).

To assess emotional phenomena in food consumption or any other domain one must be able to define emotions and to distinguish them from other states. In this respect, Plutchik (1980) reviewed 28 definitions of emotion and found very little consistency among the definitions, and some of them were rather vague in their attempts to provide a clear idea of what an emotion actually is. This dissertation does not attempt a comprehensive review of the enormous emotion literature, but one comprehensible definition of emotions was presented by Ortony et al. (1988). According to their definition emotions are “valenced affective reactions to perceptions of situations, agents or objects”.

An emotion involves a set of interacting components and is commonly treated as a multifaceted phenomenon consisting of components such as behavioural reactions (action tendency like distancing), expressive reactions (face expressions), physiological reactions (pulse rate, blood pressure), and

subjective feelings (Hoolbrook, 1986). Numerous instruments have been developed to try to measure the physiological parts of emotions ranging from facial coding schemas (e.g., Ekman and Friesen (1975)) to autonomic nervous system (ANS) skin response measurements (see Desmet (2002) and Hoolbrook (1986) for a review). Non-verbal instruments do not rely on the conscious, subjective awareness and assessment of the emotional state, and they are very resource demanding.

Disgust has a characteristic facial expression (Ekman and Friesen, 1975), the action tendency of distancing, a physiological response of nausea (not always), and a feeling component of revulsion (Rozin and Fallon, 1987), the latter being of primary interest for this dissertation. According to Hoolbrook (1986), the feeling component can be viewed as the experiential component of emotions, which Denzin (1984) has named as “lived consciousness”. This feeling represents the *qualia* for disgust, and it is considered hardest to study (Rozin et al. 2000).

As the mouth is one critical entry point to the body, the aversion to an offensive item being in the mouth is strong, and may also be stronger than to items already incorporated (Rozin and Fallon, 1987). In this respect, the *oral incorporation discomfort*, *offensiveness*, and *nausea* are discussed as very critical components of the feeling of disgust. For example, the attribute offensiveness denotes both ideational (conceptual) and sensory affective properties. Typically, feeling that something tastes disgusting does not refer only to the sensory attributes, but also to the interpretation of them (Rozin and Fallon, 1987). Furthermore, in Izard (1977) disgust is defined as a desire to move away from an object that is “spoiled”, “tastes bad” and “that leaves a bad taste in the mouth”, thus focusing on both the mouth and *bad taste properties*. Furthermore, in Plutchik’s typology (1980) the disgust response is described as “*revulsion*”, “*dislike*”, and “*loathing*”. There exists scant literature on the measurement of these feeling attributes related to food related disgust, with a few exceptions (Shimp and Stuart, 2004; Rozin, Markwith, and Stoess, 1997).

While Rozin and Fallon (1987) have underlined the distinction between the two food rejection categories distaste (rejection based on sensory dislike) and disgust (rejection primarily based on origin of the product), both categories seem to overlap on one aspect, namely, sensory dislike. Even though items in the distaste category are not considered disgusting, a disgusting item is always negatively loaded on sensory attributes (Rozin, 1989; Rozin and Fallon, 1987).

In this dissertation we will rely on assessing the subjective experienced feelings of disgust by using verbal scales. In line with the theory reviewed here this dissertation focuses on several feeling attributes of disgust related to the oral discomfort, nausea, offensiveness, bad taste, and sensory dislike. For the purposes of the different studies constituting this dissertation and depending on the linguist norms of expression for disgust within the Norwegian culture, we will rely upon these components with our choice of measurement.

### **Behavioural response (consequences of disgust)**

The consumers' psychological responses influence the way they behave towards the product. In marketing, the terms approach and avoid have been frequently applied to characterise the behavioural responses of consumers. Approach response may typically be associated with further investigation of a product, purchase, and product use. Avoid response may be associated with non-purchase/-choice and non-consumption (Howard and Sheth, 1969), or in disgust terminology, rejection of the potential food source (Rozin, 1989).

Research in consumer behaviour has focused on the choice process and purchase decisions, and brand choice or purchase has been identified as the most important variable in the behavioural outcome of interest (Bettman, 1979; Howard and Sheth, 1969). Hirschman and Holbrook (1982) referred to usage situations rather than purchase when talking about hedonic aspects of products. When focusing on activities involved in consumption, such as eating, the attention is drawn to activities after the product has been bought. In the study of food behaviour, we are typically interested in acceptance, dietary intake, consumption and habits in addition to the actual choice (Shepherd, 2001). A focus on consumption also indicates that the emotional response is the essence and goal in itself; thus prediction of behaviour is not the main focus in the dissertation. Rather, predicting behaviour is looked upon as a validity check, to confirm that the consequences of disgust are related to behaviour in the given context we are operating within. One proposition is suggested following this discussion:

***5. Disgust with food stimuli of animal origin is expected to lead to avoidance behaviour.***

This proposition will be addressed in paper 2, where we test the mediating role of disgust with meat in the prediction of red meat consumption.

## **The context of consumption**

Emotional responses to foods cannot be understood without reference to the context in which they are embedded (Hersleth et al. 2003; Shepherd, 1989), those being both to the cultural as well as the situational factors of consumption. Hence, the likes and dislikes associated with a particular food reflect the cultural environment in which the consumers are participants (Mela, 2000; Rozin, 1989). Consuming can be viewed as a type of social action in which people make use of consumption objects, such as food products, in different ways. The consumers use consumption objects to classify themselves in relation to relevant others, thus creating collective identities and cultures. The consumption object represents a vessel of cultural meaning and identity and therefore serves to build bonds between individuals and to enhance distinction from other individuals (Holt, 1995). Therefore the consumption of food or non-consumption of food is an expression of the individual and his belonging to the closest environment and to the culture (Fürst, 1994). In paper 1, we aim to provide a contextual understanding of the cultural meaning of meat and meat production and of meat's status and place in the diet among younger consumers in Norway. The subsequent quantitative studies in the dissertation will be interpreted and based upon this contextual understanding.

## **Individual characteristics in relation to disgust**

In research involving consumers, we often take a post-hoc approach to individual differences in responses. The consumers are descriptively segmented according to their discriminating characteristic in relation to the dependent variable. The hedonic perspective employs an approach in which an identification of individual variables is discussed a-priori, since differences in emotional responses seem to be closely related to such characteristics (Hirschman and Holbrook, 1982). Holbrook and Schindler (1994) have investigated characteristics such as age, gender and attitude as predictors of consumer aesthetic response. In the case of food, the difference in emotional response to products appears to be closely related to gender, experience, and more internalised characteristics as personality traits (Hirschman and Holbrook, 1982; Rozin, 1989; Sheperd, 1989). In this dissertation individual characteristics will play a central role.

With regard to the sentiments associated with the product stimuli chosen for the dissertation, literature evidences point at negative sentiments with meat as predominantly a young, female phenomenon, (Gregory, 1997; Santos and Booth, 1996; Worsley and Skrzypiec, 1998; Wright and Howcroft, 1992). It

has also been found that aversion to meat is higher among those with negative body esteem and dieting behaviours (Mooney and Walbourn, 2001; Worsley and Skrzypiec, 1997). With regard to global emotional response in general, women have in fact been found to be more intensely emotionally expressive than men (Gross and John, 1998).

Furthermore, a person with a particular personality of being angry is maybe more often disposed to experience anger, implying that traits related to the person have a direct influence on emotional response (Lazarus, 1991). Variation in personality has for example been included to explain preferences for aesthetic styles (Bloch et al., 2003). With respect to the emotion trait of disgust (sampling domains such as animals, foods and disgusting behaviours) Haidt, et al. (1994) found that gender was the best predictor of disgust sensitivity. They showed that women in all test groups appeared significantly more disgust-sensitive than males. This result was also found by Fessler, Arguello, Mekdara, and Macias (2003), who further found that disgust sensitivity declined with increasing age. Furthermore, the relationship between the emotion trait disgust sensitivity and disgust with specific stimuli has not yet received much attention in conjunction with specific products and will be addressed in the dissertation.

***6. Consumers' disgust with food stimuli of animal origin appears to be closely related to individual characteristics such as experience, gender, age, and personality.***

The last proposition will be addressed in all the papers constituting the dissertation. More specifically, we will measure the gender effect, the age effect and specific personality effects such as negative body esteem and disgust sensitivity.

## **Overall contribution and aims of the dissertation**

The doctoral project is a contribution within consumer behaviour, drawing on theory and methodology from sensory science and psychology.

The overall academic aim of this dissertation project is to bring different schools of thought together in theory and methodology.

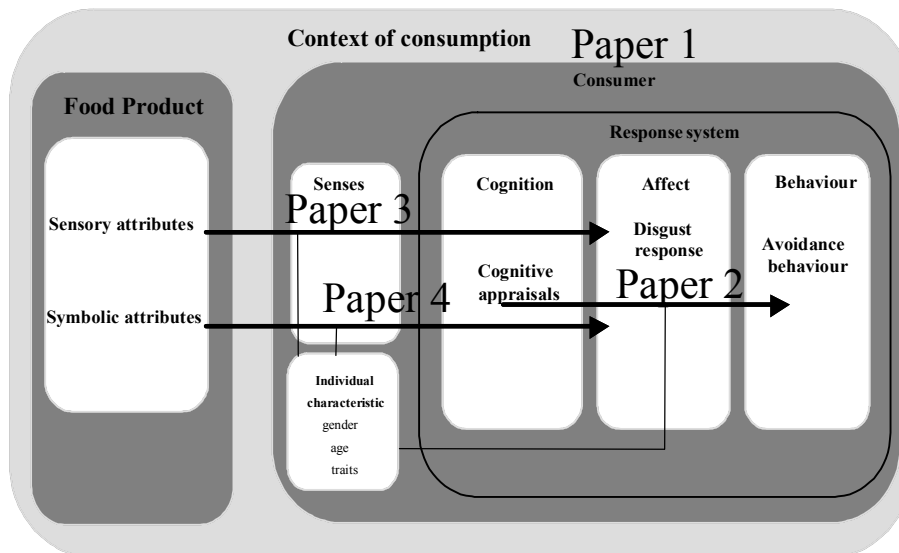
The overall research objective of this dissertation is to gain insight into the negative product emotion of disgust targeted to meat, with emphasis on the

nature of the stimuli attributes, the personal influences and individual differences in emotional response.

This dissertation intends to contribute on several levels:

1. By introducing food-related disgust the dissertation aims at building new understanding in the field of consumer behaviour.
2. By applying the theory on disgust from psychology the dissertation intends to explore, conceptualise, operationalise, and measure personal and product-related antecedents to disgust with meat.
3. Methodologically the dissertation's primary scope is to introduce methodology from the field of sensory science, which is not commonly applied in the marketing literature.
4. Managerially, this dissertation aims at increasing knowledge about the barriers to meat consumption, in order for managers in the meat industry to incorporate and use this information in practical product development, product presentation, and market communication.
5. Empirically, this dissertation seeks to build new knowledge about properties (significate and sign/symbolic) of disgust provoking stimuli, the personal antecedents and sources to individual variance in disgust with meat.

The dissertation consists of four inter-related papers, and the papers' main aspects of study can be illustrated in the following way with respect to the overall theoretical framework:



*Figure 1.2. The individual papers' positioning in the theoretical framework*

The overall aim of the papers was to explore, conceptualise, operationalise and measure different variables related to the overall framework. The studies are different in several aspects, as they are written at different stages in the doctoral training and are influenced by different ideas and levels of knowledge at each stage.



## **Short presentation of studies and specific aims**

### **Paper 1: Attitudes towards meat and meat-eating among adolescents in Norway: A qualitative study.**

*This qualitative study especially focused on the exploration of disgust reactions in relation to meat. The study aimed at achieving a better contextual understanding of the motivation for likes, dislikes, and disgust reactions related to different varieties of meats in the younger generation of consumers in Norway, by investigating the cultural meaning of meat and meat production, meat's status and place in the diet, and underlying factors related to body concern.*

The study used a qualitative approach of semi-structured nature among teenage male and female consumers. A sample of 30 high school students (16 to 17 years) participated in the study: 10 urban females, 10 rural females, and 10 rural males. The participants' attitudes towards meat and meat-eating were investigated through interviews of a semi-structured nature and a short, confidential questionnaire. The study showed that disgust was solely related to red meat varieties and not to chicken. There were no vegetarians in our consumer sample, but red meat-eating was more common among males than females. Sensory and symbolic attributes related to disgust were identified, and these were particularly addressed by the females. Negative associations to meat were based on disgust among females, but on distaste among males.

### **Paper 2: A study on the mediating role of disgust with meat in the prediction of red meat consumption among young females.**

*The aim of the study was to operationalise and measure the effect of cognitive appraisals (ideational, sensory affective, anticipated consequences) and negative body esteem on red meat consumption as mediated by disgust with meat among young females.*

Having provided the contextual understanding of the antecedents of the phenomenon under study, we now turn to the prediction of it. According to Rozin and Fallon (1987) the primary concern responsible for disgust is threefold: ideational, sensory affective and anticipated consequences. Within these cognitive appraisals different considerations were operationalised and subjected for empirical testing. In this paper the link between negative body esteem and disgust with meat was also investigated. All these aspects were

tested in a sample of young females, since these aspects seem particularly to be found among females.

Five concepts were hypothesised to influence disgust with meat positively: Moral concerns for animals (ideational), concerns due to notable texture in unprocessed meat (sensory affective), concerns related to visible blood in meat (ideational/sensory affective), concerns related to satiety from meat consumption (anticipated consequences), and negative body esteem (individual characteristic). Structural Equation Modelling (SEM) was applied for testing the theoretical model and hypothesised relationships in 866 young female consumers from 15 to 18 years old. The investigation showed that all the concerns and negative body esteem were positively related to disgust with meat, and disgust with meat influenced consumption of red meats negatively.

### **Paper 3: Gender specific preferences and attitudes towards meat.**

*The main objective of the study was to operationalise and measure the effect of sensory attributes in meat stimuli on sensory dislike as an effect of gender and to establish the link between meat attributes and meat attitudes.*

No study has yet addressed whether dislike and negative attitudes towards meat are linked to specific sensory attributes of animal products. We hypothesise that red meat attributes are linked to dislike and negative attitudes among young female consumers. The primary scope of this study was to test this relationship quantitatively through actual tasting of meat samples. In the second study we predicted recalled disgust with meat based on prior meat consumption experiences, which is a common approach in the field of consumer behaviour. Besides relying on the cognitive representations of product interactions in the testing of affective dimensions (paper 2), the approach for the third paper was to have consumers actually perceive the products. This paper introduced methodology from sensory analysis to accomplish this. The study applied both a quantitative sensory profiling with trained panellists (used as an instrument to operationalise the sensory attributes) and a consumer taste study with a convenience sample. The trained sensory panel evaluated 22 sensory attributes of five meats, ranging from red (beef) to white (chicken) meat varieties. In this way the sensory mapping of the product and its characteristics served as an objective anchor point for consumer evaluations. Comparable samples of the same meat varieties were served in randomised order to 206 young consumers, males and females between the ages of 14 and 30 years, in a blind hedonic test. Attitudes towards meat-eating and desired change in consumption frequencies of meat products were also collected. The link between

consumer and product was established, and it revealed a close relationship between specific sensory attributes of meats and consumer attitudes towards meat. The hypothesis that red meat varieties were linked to dislike and negative attitudes among females was confirmed.

#### **Paper 4: The effect of animality in the consumption experience: A potential for disgust.**

*The scope of this paper was twofold. Our first aim was to conceptualise and operationalise three aspects of animality. Secondly, we wanted to manipulate these symbolic elicitors of disgust in an experimental setting and measure disgust responses at the prospect of eating as an effect of age, gender, and disgust sensitivity.*

In the third paper we focused on the sensory, physical attributes of the meat-stimuli in the product person interaction. In the last paper we now turn to the symbolic properties. The negative symbolism attached to meat and the taboos of meat eating have been extensively documented in cultural studies (Adams, 1990; Douglas, 1996; Døving, 2003; Fiddes, 1991; Guzman et al., 2000; Lupton, 1996; Simoons, 1994). However, the notion of negative symbolism seems quite intangible and difficult to operationalise for empirical testing. This is a challenge that has been dealt with in the last paper. In this last paper we have made an attempt to conceptualise, operationalise and test the effect of animality on perceived disgust at the prospect of meat eating.

Three components of animality were conceptualised and subjected for empirical testing; Meat Typicality, Vividness and Personification. The consumer sample consisted of 119 adolescents and 117 adults (118 females and 118 males). Overall, the symbolic aspects of animality were all shown to significantly increase the mean disgust response. The meat stimulus' symbolic association to the flesh was found to be the primary elicitor of disgust with meat. The results also showed a relatively good performance of personality measures, such as disgust sensitivity, in the prediction of disgust with meat. Empirically, this study provides evidence for disgust with meat as being a phenomenon particularly concerning females and young consumers.

## **The papers' present status.**

### **Paper 1**

“Attitudes towards meat and meat-eating among adolescents in Norway: a qualitative study” was authored by Elin Kubberød, Øydis Ueland, Åsne Tronstad, and Einar Risvik. This paper was published in *Appetite*, 2002, vol.38, 53-62.

### **Paper 2**

“A study on the mediating role of disgust with meat in the prediction of red meat consumption among young females” was authored by Elin Kubberød, Øydis Ueland, Einar Risvik and Inge Jan Henjesand. The paper was accepted in *Journal of Consumer Behaviour* in October 2004.

### **Paper 3**

“Gender specific preferences and attitudes towards meat” was authored by Elin Kubberød, Øydis Ueland, Marit Rødbotten, Frank Westad, and Einar Risvik. This paper was published in *Food Quality and Preference*, 2002, vol.13, 285-294.

### **Paper 4**

“The effect of animality in the consumption experience: A potential for disgust” was authored by Elin Kubberød, Øydis Ueland, Gunvor Irene Dingstad, Einar Risvik and Inge Jan Henjesand and submitted to *Journal of Food Products Marketing* in December 2004.

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## **Contents part 2: Papers**

**Paper 1: Attitudes towards meat and meat-eating among adolescents in Norway: A qualitative study**

**Paper 2: A study on the mediating role of disgust with meat in the prediction of red meat consumption among young females**

**Paper 3: Gender specific preferences and attitudes towards meat**

**Paper 4: The effect of animality in the consumption experience: A potential for disgust**

*Appetite* (2002) 38, 53-62

doi: 10.1006/appe.2002.0458, available online at <http://www.idealibrary.com>

## **Attitudes towards meat and meat-eating among adolescents in Norway: a qualitative study**

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*(Received 9 July 2001, final revision 15 January 2002, accepted in revised form 23 January 2002)*

The aim of this study was to explore the concept of disgust in relation to meat and meat-eating. A sample of 30 high school students (aged 16 to 17 years), 10 urban females, 10 rural females, and 10 rural males, participated in the study. The participants' attitudes towards meat and meat-eating were investigated through interviews of a semi structured nature and a short, confidential questionnaire. The study showed that disgust was solely related to red meat varieties and not to chicken. There were no vegetarians in our consumer sample, but red meat-eating was more common among males than females. Sensory attributes that were drivers of liking for meat were good taste, good smell and juiciness; these were described by both genders. All the females tended to characterise meat and meat-eating experiences negatively. Their associations were based on disgust, rather than distaste as found among males. Offensive attributes that the females attributed to meat were linked to the animals and their body parts, blood and raw meat, fibrous and chewy texture, fatty feeling in the mouth, and visible fat. Subjects with regular contact with farm animals displayed more relaxed attitudes towards animal production and showed no such disgust reactions. Females also tended to associate meat with "heavy" food that had negative impact on their bodies. They were also less content with their body appearance, dieted more than males, and tended to associate health (in the sense of fat consumption) and food intake to the wish for slim bodies.

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The authors would like to thank Marit Rødbotten and Ellen Tronrud for useful feedback during the preparation of this manuscript. Thanks also to referees for very helpful comments.

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## Introduction

Historically red meat has played a central role as a symbol of wealth and higher social classes. Meat is an important provider of protein and iron and considered essential for good health. Therefore, meat generally is considered synonymous with the idea of “proper” food (Lupton, 1996). Red meat, as a high-energy type of food, has for long been considered appropriate for men and symbolises strength, power, and typical values related to the masculine identity (Adams, 1990; Bourdieu, 1984; Lupton, 1996; Twigg, 1983). Chicken, on the contrary, has little fat, appears white, and is associated with the female identity (Lupton, 1996).

Meat is also an example of food that may incorporate negative associations in the Western world today. Despite its high status, meat has connotations of ambivalence due to its link to the living animal, blood (Guzman & Kjærnes, 1998), aggression, and violence (Lupton, 1996). Furthermore, meat is also seen as a potential carrier of dangerous contaminants and may lead to various diseases (Fiddes, 1991). The negative associations related to meat have been further strengthened due to the constant debate around the use of hormones, the emergence of BSE (mad cow disease) in UK in the 1980s, and, more recently, the outbreak of foot-and-mouth disease.

Recent trends show that consumption of red meat is declining among specific consumer segments in the industrial countries. It is well recognised that reduced meat-eating, and the negative feelings associated with meat, are strongest among females (Gregory, 1997). Richardson *et al.* (1993) showed that in the UK twice as many married females were semi-vegetarian compared to males, whereas three times as many single females were semi-vegetarian compared to men in the same life situations. Studies, both in the UK and Australia, have shown development towards meatless eating especially among young female women (Santos & Booth, 1996; Worsley & Skrzypiec, 1997, 1998; Kenyon & Barker, 1998). In contrast to the characteristics of pure moral, health and ethical vegetarians, there seem to be more personal and emotional reasons for adapting to meatless eating, one such reason being increased body concern. In fact, findings have shown that adolescent women do not always avoid meat completely, and even though they may refer to themselves as vegetarians, they still eat processed meats (Wright & Howcroft, 1992).

An important characteristic feature concerning meat avoidance is by young females their perception of meat as a fattening food. Some of the females leaning towards meatless eating were concerned about being slim and tended to restrict their energy intake (Ryan, 1997; Worsley & Skrzypiec, 1997).

The physical characteristics of the food such as taste, smell and texture are also important for determining meat rejection. Distaste as motivation for rejection is “sensory-affective” and is solely based on the experience that an

object is unpalatable due to negative sensory properties (Rozin & Fallon, 1980, 1987). A negative reaction to blood in meat could also be developed from the idea that its presence can be associated with the slaughtering and death of animals (Elias, 1978; Twigg, 1979). This type of rejection is based on the knowledge of the origin, nature or history of a food; it is an expression of disgust. Disgust encompasses both negative sensory affective and ideational properties, although the latter are not present for distaste (Rozin & Fallon, 1987). With this in mind, Kenyon & Barker (1998) compared vegetarian and non-vegetarian teenage girls with an average age of 17 in their qualitative approach. In this study, meat was considered a negative symbol for the vegetarians; they abhorred the killing of animals, and the sensory characteristics of meat, especially the sight of blood, were experienced as repulsive. Santos and Booth (1996) found that dislike of meat and disgust with “bloody” and “raw” meat were frequently mentioned among meat restrainers and vegetarians as reasons for avoiding flesh foods. Indeed “animalness” is central in the theoretical perspective on disgust because almost all disgusting items are of an animal nature (Rozin & Fallon, 1980, 1987).

Attitudes towards meat among younger consumers have not yet been well explored in Norway. The Norwegians have been relatively unaffected by the dramatic changes in meat consumption found elsewhere in Europe. Lien *et al.* (1998) showed, however, that Norwegian females were, compared to males, more disposed to reduction in meat consumption. In addition, residents in rural areas displayed less negative attitudes towards meat production and were less critical concerning their own meat consumption than people from urban areas. In future, potential meat avoidance by young females could persist through adulthood and later form the food habits of the future generations (Gregory, 1997).

This qualitative study has focused on the exploration of disgust reactions in relation to meat. Our aim was to achieve a better understanding of the motivation for and features of likes, dislikes, and disgust reactions related to different varieties of flesh foods by investigating the cultural meaning of meat and meat production, meat’s status and place in the diet, and underlying factors related to body concern. The study used a qualitative approach of a semi-structured nature among young male and female consumers from rural and urban areas.

## **Method**

### **Subjects**

Thirty students at high school level aged 16 to 17, were recruited during the spring of 2000 through direct contact with school officials in the south-eastern part of Norway. The schools selected for the study represented a rural area and an urban area in the suburbs of the capital city. The consumer sample participating in the study consisted of two groups of 10 females from the rural and the urban school, respectively, and one group of 10 males from the rural school. In order to obtain a random sample of adolescents with as much variation in attitudes as possible, no pre-screening of respondents was performed. All the subjects participated voluntarily.

### **Procedure**

The students' attitudes towards meat were explored by interviews of semi-structured nature (Patton, 1990), following an interview guide based on literature studies. The interviewees were allowed to talk as freely as possible about the outlined issues; the interview guide served only as a basic checklist for covering all the relevant topics. Sometimes "cues" were given in order to facilitate the association process and to help the respondents to express their opinions and attitudes. The questions asked were designed with special emphasis on the topics listed in Table 1. The interview sessions lasted for approximately 1 hour. In addition to recording the sessions on tape, notes were taken. The tape recordings were transcribed and compared to the notes afterwards.

The questions concerning personal and emotional matters, such as dieting and weight control, were phrased in a projective manner (person-projective technique, which allows for the respondents to project thoughts onto other persons, in this case other friends). This was done in order to overcome the limitations of respondents' information hold back and to capture an indirect measure of the consumers' thoughts and attitudes around their own bodies (Supphellen, 2000).

In addition to the interviews a short, confidential questionnaire was included at the end of the interviewing sessions. This was done to validate our perceptions of the respondents' attitudes towards the selected topics, specifically the most sensitive questions concerning body, weight and dieting. Answering these questions was optional and allowed for multiple choices. In order to obtain a diversified description of consumption of red and white meats, questions about how the respondents would characterise their own consumption of meats were included in the questionnaire.



**Table 1. Topics for the interview guide**

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*Associations related to meat*

What is the first thing that comes into your mind when I say “meat”? Could you characterise different varieties of meat to me?

What are the differences and similarities between various types of meat?

*Meat consumption: frequency, appropriateness, and vegetarianism*

How often do you eat meat?

Do you see any reason for eating more or less meat?

What is your opinion concerning vegetarianism? Do you see any arguments for or against vegetarianism?

When do you eat meat (occasions and appropriateness)?

How would you characterise the position of meat as a constituent in the Norwegian diet?

*Sensory properties, body feel and disgust related to meat*

What does meat taste like?

What does meat smell like?

Could you describe the texture and mouthfeel when eating meat? How do you feel after having eaten meat?

*Dieting, weight control and health*

If you take a look at the students in the schoolyard, do you see many fat students among them? Is dieting normal among your friends?

Is weight control and body appearance discussed much among your friends? What types of food would be appropriate for dieting?

What foods are considered to be fattening?

What foods do you consider to be healthy and unhealthy?

What does a healthy diet consist of?

*Animal production*

What is your opinion concerning the slaughter of animals?

What is the first thing that comes to your mind when I say “meat production”? Do you ever make any reflections on where the meat comes from?

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## Interview analysis

The first step in the content analysis included a classification of the data. The data were converted into systematic categories according to convergence (Patton, 1990). The selected categorisation was, as far as possible, based on the themes in the interview guide. The categories were then judged on two criteria: “internal homogeneity” and “external homogeneity”, meaning to which extent the information belongs to which category and to which extent the categories differ and/or are unique (Patton, 1990). The results were obtained by going back and forth between the data and the classification domains to verify the meaningfulness, salience, uniqueness and accuracy of the categories and the information in them.

## **Results**

### **Interview results**

Associations from the interviews related to the selected topics are presented in Tables 2-4. The interview topics are supplemented with figures based on the answers from the questionnaire (Figs 1, 2). Direct quotations in the result chapter are presented in quotation marks.

### **Associations related to meat**

When the respondents talked about “meat”, they referred to it as being only red meat, such as beef. Regardless of gender and place of residence, chicken, other white meats, and processed versions of meat, were never mentioned by any of the respondents as being associated with the term “meat”. Meat cuts defined as entrails (liver, black pudding, and tongue) were declared as totally unacceptable to eat. The associated terms related to meat are listed in Table 2. The attributes described are grouped under positive or negative statements, according to the respondents’ emotional reactions when they discussed meat. Based on belonging, the attributes were utterly classified in appropriate groups, such as “taste” and “texture”.

The respondents seemed to have experience with the existing varieties of meats. However, without prompting, they found it hard to verbalise the origin and differences of the meats. The females, regardless of place of residence, seemed to be less aware of the diversities and their origin, than the males. The main distinction the respondents made between meats was the terms “red” and “white”. When helped by the interviewer, beef, lamb, and pork were mentioned as red meat varieties, whereas chicken was the only meat classified as white. Chicken was perceived to be distinctly different compared to “normal” meats. There was no big difference between rural and urban females regarding knowledge of meats, though lamb was only discussed and seemed quite popular among urban women. The attributes the respondents related to meats are presented in Table 3.

Within the category of red meats, pork was considered as being the most unhealthy and fatty. Lamb was considered healthier and perceived as less fatty compared to beef. Compared to the males, all the females tended to focus more on the aspect “fat”. One female respondent stated: “Pork is the most fattening meat”.

**Table 2.** Terms associated with meat

Positive	<i>Classification</i>	Negative	<i>Classification</i>
Steak	<i>Food</i>	Living animal*	<i>Personified animal</i>
Taste good	<i>Taste</i>	Beef, horse, lamb, pork*	<i>Personified animal</i>
Juicy	<i>Texture</i>	Red*	<i>Appearance</i>
Good smell (from frying)	<i>Odour</i>	Bloody*	<i>Appearance</i>
		Dry	<i>Texture</i>
		Sticky	<i>Texture</i>
		Bad smell	<i>Odour</i>
		Slimy*	<i>Appearance</i>
		Fatty*	<i>Taste / Mouthfeel</i>
		Fat*	<i>Appearance</i>
		Tough*	<i>Texture</i>
		Liver*	<i>Organ / entrails</i>
		Black pudding*	<i>Organ / entrails</i>
		Tongue*	<i>Organ / entrails</i>

Italicization based on the definition of the researcher.

\*Items having offensive properties due to nature of origin (classified as disgust).

**Table 3.** Terms attributed to red and white meats

Red meat (beef, pork, lamb)	<i>Classification</i>	White meat (chicken)	<i>Classification</i>
Fatty*	<i>Taste/mouthfeel</i>	Healthy	<i>Health</i>
Tough*	<i>Texture</i>	Unsaturated fat	<i>Health</i>
Fat*	<i>Appearance</i>	Food appropriate for dieting	<i>Health</i>
Saturated fat	<i>Health</i>	Neutral flavour	<i>Taste</i>
Unhealthy	<i>Health</i>	Good smell	<i>Odour</i>

Italicization based on the definition of the researcher.

\*Items having offensive properties due to nature of origin (classified as disgust).

### **Meat consumption: frequency, appropriateness, and vegetarianism**

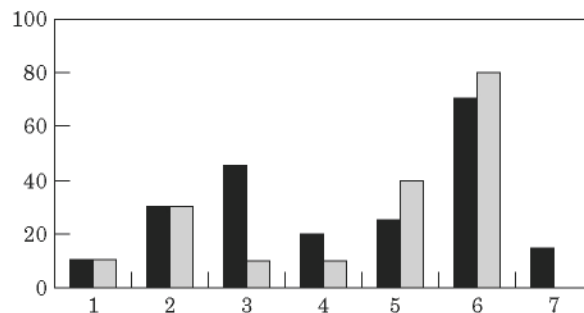
There were no respondents who reported themselves to be vegetarian in the study. Regardless of gender and area, all of them consumed meat in one form or another, and reported a consumption frequency of more than 3-4 times per week (including all meat varieties and processed meat).

Steak, lasagne, tacos, kebabs, hamburgers, roasts, and chicken were mentioned as typical foods appropriate for special occasions with the family and when attending parties. Most of the informants liked to eat mixed courses such as pizza, kebab and processed meat (such as hamburgers) when

going out with friends, and liked to eat, for example, steak when they went out with their parents to a restaurant. The reported reason for the latter finding was that unless their parents paid for them, steak was too expensive to order. The females also mentioned that they ate steak when going out with their boyfriend.

In the questionnaire the informants were asked to characterise themselves in relation to their meat-eating habits, see Fig. 1.

The results, as presented in Fig. 1, indicated no differences between gender for “eat little meat” or “eat only processed meat”. The biggest gender difference was found for the category “eat white meat preferably”. Forty-five percent of the females reported they preferred white meats, in comparison to 10% of the males. There were also more females who stated that they rarely ate red meat (20%), whereas 40% of the males reported that they ate red meat often. Both genders reported eating a lot of meat. Only females reported preferring vegetables to meat.



**Figure I.** The respondents’ characterisation of themselves in relation to their meat-eating habits. Frequencies are presented in percentages. Females, N=20 (■), males, N=10 (■). Note that the question allowed for multiple choices and therefore the percentages do not add precisely up to 100. (1) Eat a little meat; (2) eat only processed meat (e.g. hamburgers); (3) prefer white meat; (4) rarely eat red meat; (5) often eat red meat; (6) eat a lot of meat; (7) prefer vegetables.

Most of the males were quite satisfied with their meat consumption. In fact, one wished to increase his meat consumption because of its tastiness. Only one male mentioned that people usually eat too much meat. The males postulated that meat was an important food in their diet and reported hedonic reasons such as “good taste” to legitimate their consumption.

Females mentioned to a large degree that they felt they consumed meat far too often. Compared to the males, they generally agreed that meat consumption should be reduced and consumption of vegetables increased. Although most of them considered meat to be a natural and important part of

Norwegian culture, there was disagreement about the role of meat in their own diet. One of the girls stated “Meat is too important, we actually don’t need that much meat in our diet”. Two females would consider shifting to a meatless diet. One mentioned that she felt guilty after eating meat and felt slaughtering was awful. Therefore she preferred to eat more vegetables. Some females stated that they had little influence on the menu because they were still living with their parents. A few of the females would have reduced their meat consumption had they been allowed to, but reported that as long as they were living at home they felt obligated to eat what was on the dinner table. Furthermore, they stated that when leaving home, they would probably reduce their meat consumption. The males on the other hand, expressed no such restraints about eating meat.

The males professed no understanding for vegetarianism. The only reason they came up with as acceptable for vegetarianism was if your religion forbids you to eat meat. Generally they were not especially interested or moved by this subject. A typical male comment was as follows: “I understand that some people take pity on animals, but they have some weird opinions on what is natural”.

The females displayed more sympathy with vegetarianism. One declared that she had been influenced by a female vegetarian friend to eat less meat. Three reasons were mentioned for becoming a vegetarian: inhumane slaughtering practises, feelings of pity for animals, and meat not being considered healthy. The thought of killing animals made meat a disgusting entity for some females. During the discussions, however, it seemed obvious that motives for becoming a vegetarian mainly concerned health reasons.

### **Sensory properties, body feel and disgust related to meat**

Most of the respondents described meat as good and tasteful. Compared to the males, who had few comments beyond that meat tasted good, the females reported more negative experiences with respect to taste (see also Table 2). Typically, females felt meat was “fatty” and that “one gets fatty residues accumulating around the gums after eating meat and that’s disgusting”. Except for one male who preferred a bloody steak, all the students agreed that steaks should be well done and appear without blood. Several female respondents also claimed that while meat itself did not taste of much, all the accompaniments did. For example, one female mentioned that she could eat hamburgers every day, because of all the “good stuff” served with them. In one of the female groups there was also agreement that a vegetarian hamburger was just as good as the meat alternative.

Regarding texture and mouthfeel, only females described beef as being

tough, fibrous and difficult to chew. Meat that felt too hard to chew was considered disgusting, indicating that the disgust response increased as the meat felt more intense in the mouth due to the fibrous texture. On the other hand, due to low chewing resistance, hamburgers and chicken were mentioned as being preferable.

Compared to the males, the females also had strong opinions about the body feel related to consuming meat. Meat was considered to be a “heavy” food and was reported to be hard to digest. After eating red meat they felt full and uncomfortable.

An overview of both positive and negative statements is presented in Table 4.

**Table 4.** Statements given by males and females concerning the aspects of eating meat

	Positive statements	Negative statements
Female	“Meat tastes good” “Meat is a delicacy” “Mutton-and-cabbage stew is actually good” “Meat balls taste good” “Trimmed grilled meat is better”	“Fried meat is not good for you” “Meat tastes of fat” “Meat is boring” “Meat is not slimming” “Pork is disgusting” “Raw meat smells disgusting before you prepare it” “Meat is expensive” “Meat is often disgusting” “Mutton-and-cabbage stew is awful” “Boiled meat is not good” “Steak doesn’t taste of very much but the accompaniments do”
Male	“Food hadn’t been the same without meat” “Meat tastes very good” “Roasted moose smells nice” “Meat is healthy” “Meat contains a lot of good things” “I would very much like to eat more meat” “I eat a lot of fried chicken drumsticks because they taste good, and are cheap and convenient” “Meat constitutes a proper and good dinner” “It is easier to fry meat than to boil cod”	“Meat by itself is not so good” “I don’t like lamb very much” “I hate steaks cooked rare” “Pork is perhaps a little too fatty” “Raw beef sandwich is not so good” “Hamburger is not the ideal meal” “Steak is too expensive”

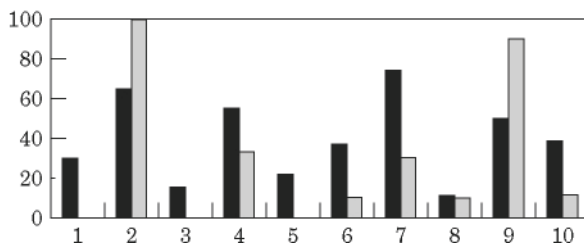
### Dieting, weight control and health

The males stated that to their knowledge no one in their male circle of friends had been dieting. The females reported that many among their female friends dieted, and claimed that many girls were too fat. They also stated that social pressure forced them to be concerned about weight and appearance.

In spite of the intense focus on weight restriction, the female respondents

stressed that it was not considered appropriate to reveal that one was dieting or monitoring body weight. One female stated that in social situations it was considerably better to pretend not to be hungry. When the females referred to themselves, they claimed to be satisfied with their own body. One female stated: “It is important to appreciate your body and it is natural to have curves”. While they stressed the importance of this, they later revealed they felt it important to monitor their weight. This was confirmed in the confidential questionnaire (Fig. 2).

According to the results presented in Fig. 2, one third of the females reported that they felt they weighed too much, but none of the males did so. Only females reported frequent dieting, while the males did not. Compared to 65% of the females, all the males reported satisfaction with their weight. Fifty-five percent of the females reported monitoring their weight, whereas about one third of the males did so.



**Figure 2.** The respondents’ body concerns. Females N=20 (■), males N=10 (■). Note that the questions allowed for multiple choices and therefore the percentages do not add precisely up to 100. (1) Weigh too much; (2) satisfied with weight; (3) often dieting; (4) monitor weight; (5) look too fat; (6) exercise to keep weight down; (7) concerned about what I eat; (8) smoking keeps weight down; (9) satisfied with body shape; (10) eat vegetables when dieting.

Three quarters of the females (73%) also displayed concern about what they ate. A few (both genders) reported that smoking stabilised weight. Most of the males reported satisfaction with their own body shape, compared to 50% of the females. More females were found in the category “prefer to eat vegetables when dieting”.

When discussing meat in relation to dieting, one male mentioned that meat should be part of a slimming diet, but there were also respondents who said that white meat was healthier and that one should reduce meat consumption when dieting. Males found identifying appropriate foods for dieting more difficult, but low fat spread and vegetables were mentioned. Generally, they were less concerned about dieting.

The females, on the other hand, were certain that meat was not considered to be part of a slimming diet; it all depended on “what type of meat you consumed”, method of preparation and amount. In this respect, chicken was mentioned as being part of such a diet. “Meat is not slimming” and “chicken is healthier, but if you are on a diet, you should not eat meat at all” were typical statements from the females. Although hamburgers were one of their favourite foods, they were felt to be “not good for your health”. When mentioning foods for dieting, the female respondents suggested wholewheat bread, rye crispbread, yoghurt, green salad, juice, fruit and vegetables.

In contrast to the females, the male respondents gave the interviewer the impression of not being very particular about or interested in food and health. A healthy diet was associated with fish, meat, cereals, vegetables, dairy products and “low calorie products”.

A typical statement from this group was “A healthy diet consists of varied and enough food, otherwise you get weak”. Females associated a healthy diet with water, juice, fruit and vegetables. Healthy food was also associated with “low fat” foods.

All respondents agreed that males ate more than females. The males believed that females display higher concern about food and diet and therefore eat less. They also believed that the females are much more concerned about body appearance than they are.

## **Animal production**

Generally, the respondents stated that they felt slaughtering to be a necessary evil. Some of them expressed disgust with the physical act of slaughter.

There was no particular divergence concerning slaughtering among the males. A typically male statement appearing during the discussion was: “Humans have since the beginning always eaten meat”. The males reported that they did not think of the living animal when eating meat. However, two of the males displayed a negative feeling towards slaughtering.

Both female groups expressed concerns towards animals as food, all related to disgust. Some of them felt it was unpleasant to think of the living animal when eating meat. One respondent said that she could not finish her meat if some of the family members started to joke about the origin of the meat on the dinner plate. A few females reported displeasure when preparing and touching raw meat. Several stated that they were generally against locking up and raising animals only to see them get slaughtered later on.

Thinking about the word “meat production” brought up different associations in the groups. One male stated that by growing up on a farm you develop a more “natural” and “realistic” attitude towards raising animals for



food. Females thought of the words “animal”, “slaughtering”, “lots of blood”, “beef cattle”, “pigs”, and “small chickens in narrow cages”. They stated that because of the association with a production factory, meat production troubled them. Only females stated that animal production was environmentally wrong and a waste of resources. One female from the urban group suggested cutting down on the animal herds to reduce meat production, and another informant in this group also stated that one could survive without raising animals for food.

The major concern of all the subjects regarding animal production was that they did not trust the industry to handle the animals well, and that, because it was not open to the public, the producers cheated on animal welfare during the slaughtering process. One male respondent stated he did not trust the animals to be handled in a humane way, because “it is always a matter of money”. One female believed most farm animals were handled well at the slaughterhouse, except for battery chickens.

The males generally believed that the animals had a good life on the farm, particularly when they were out-of-doors during the summer. The female groups displayed much greater doubt about this. One female mentioned she had heard of many cases of cruelty to animals reported to the authorities.

There were apparent gender differences throughout the discussions regarding this theme, but we found no clear differences between the two female groups. However, there were a few examples from all groups of more relaxed attitudes towards animal production, due to more frequent contact with farm animals. The urban female group included a Lapp, quite used to and relaxed with, raising, slaughtering and eating animals for food.

## **Discussion**

Associations attributed to meat revealed the term “meat” as being associated only with red meat. The attributes associated with chicken were of a more positive character than those related to red meat, which were to a large extent based on disgust.

Sensory properties that were drivers of liking for meat were typically good taste, good smell, and juiciness, and these were mentioned by both genders. Most of the negative features of meat were related to specific sensory attributes of meat, linked to the living animal, and to entrails and organs. The offensiveness refers not only to the concrete characteristics but also to the subjects’ interpretation/conceptualisation of them (Rozin & Fallon, 1987). Sensory drivers of disgust with meat were appearance of fat, difficulties with chewing due to fibrous and tough texture, fatty feeling in the mouth, and the appearance of blood and raw meat. These were described particularly by the female respondents. Parallel results were found in a quantitative follow-up

study by Kubberød *et al.* (Note 1). Kenyon & Barker (1998) and Santos & Booth (1996) found disgust with meat among their female respondents due to the emotional reaction to blood by smell and sight.

Our male subjects described their experiences with meat often in dualistic terms, as either “good” or “bad”, for example “taste good” and “taste bad”. The interviewers’ impression was that males actually seemed to enjoy eating meat more than the females did. Any negative reactions to meat among the males seemed to be motivated by sensory factors alone, which is characteristic for distaste (Rozin & Fallon, 1980, 1987). The females were overall more emotionally involved when talking about meat; they were stronger in their vocabulary when describing what they liked and disliked, and they often used the expression “disgusting” when talking about taste experiences and attributes of meat. The young women’s reactions included, in addition to sensory-affective, also ideational motivations, in contrast to the males’ reactions. They were more concerned and troubled about the slaughtering of animals and did not want to associate the image of the living animal with the steak on the dinner plate. Our study also showed that respondents with regular contact with animals displayed more relaxed attitudes towards animal production, showed no disgust reactions, and justified the necessity of slaughtering animals for food.

Processing or cooking the meat before consumption, removes it from its origins; the loss of redness makes the meat less linked to the living animal (Gregory, 1997). Therefore it may be important to “disguise” the food’s animal nature by removing parts like skin and bones and prepare the meat in a non recognisable form in order to avoid disgust reactions (Rozin & Fallon, 1987). Guzman & Kjærnes (1998) described this as a process of “de-animalisation”. The same reaction applies for entrails and related products, which could be associated with organs and other parts from the animal body, and reminds the respondents of the happy living animal on the farm. For a true vegetarian the thought of eating “your friend” (Twigg, 1983) is repulsive and totally unacceptable. For meat restrainers it is acceptable to eat meat as long as it is reduced to a non-subject, transited and moved away from the personified animal. This theory may give an explanation for why the respondents in our study attributed few negative terms to chicken. Chicken had, in contrast to red meat, few disgust properties, and this could probably come from the fact that chicken may be viewed as a less sentient being. The nature of being less of a personified animal makes chicken easier to eat (Worsley & Skrzypiec, 1998). In this respect hamburgers, as a typical “de-animalised” type of flesh food, were very popular among our respondents.

Also the females tended to focus more on fattiness, specifically the aspect of visible fat in red meat such as pork. Therefore meat was not considered healthy or part of a healthy diet among the females. According to females, a

healthy diet consisted of mostly fruit and vegetables. The aspect of meat as fattening was also found among female respondents in related studies (Ryan, 1997; Worsley & Skrzypiec, 1997). In another study by Lupton (1996), red and white meats were referred to as dichotomous terms that were considered unhealthy and healthy, respectively.

The reason for the negative focus on fat in flesh foods may be complicated. First, the negative reaction to fat could have arisen because of the offensiveness the females experienced with visible fat in red meat, and the unhealthiness of red meat could just as well have been mentioned as an alibi for their disgust with visible fat in meat. Secondly, the females were very concerned about food and health, in the sense of getting too fat. In this respect, Guzman *et al.* (2000) revealed that young people tended to associate health with good looks and slim bodies. The females' body concern could also have been a reason for their intense focus on fattiness in meat. Dieting was shown to be common among the females, but was discussed as a non-legitimate, private activity. Our results further confirm the findings of Guzman *et al.* (2000) and Worsley & Skrzypiec (1997), which suggest that females tend to attach health and food to their own body images. Compared to the more "restricted" females, the males in our study seemed to have a more pragmatic and content view on their own diet and bodies, and displayed no such disgust with or concern for fat in meat. Wesslén (2000) proposed that young females and males might belong to different food cultures, i.e. "hungry boys and slim girls". The results concerning body feel related to meat-eating, support the argument suggesting that females tend to associate meat with "heavy" food having negative effect on their own bodies (Lupton, 1996). A resistance towards bodily incorporation and nausea associated with specific objects is also a characteristic feature of disgust (Rozin & Fallon, 1987).

Both the offensive and unhealthy properties associated with meat could lead to restrictions concerning red meat-eating in the future. Our results showed that females, in contrast to males, displayed a much higher concern for their own meat consumption. They thought of meat as being an overestimated constituent in the Norwegian diet, felt obligated to eat meat, and were troubled by their parents' influence on their dinner habits. Worsley & Skrzypiec (1998) found that pressures by parents to eat meat were common among one-third of the vegetarians in their sample. For these reasons some of the females in our study proposed a change in their diet when leaving home, and this was also concluded by Beardsworth & Keil (1991). Interestingly enough, the males in our study felt no concern or obligations related to their meat-eating. Though the structure of meat-eating was somewhat different for males and females, none of our interviewees were vegetarians. Only females displayed sympathy with vegetarianism; for males, vegetarianism was not an issue of consideration. Males reported

eating red meat more frequently than females, and females, to a larger extent, preferred white meat and vegetables. Results from previous studies also reveal that females tend to avoid red meats more frequently than males do (Santos & Booth, 1996; Worsley & Skrzypiec, 1998).

Taking into account that some gender differences in attitudes and preference could be due to coming from different geographical areas, our results still confirm that disgust with and scepticism related to meat and meat-eating are more common among females. The most striking differences found in attitudes among our subjects were between rather than within genders and applied to both rural and urban females. Fürst (1994) suggested it is more appropriate to talk about “gendered” food rather than foods for different classes of people. She hypothesised that female preference for lighter foods is a general phenomenon. Worsley & Skrzypiec (1998) further found few statistically significant differences between subjects from different socio-economic areas, because meatless eating appealed to the younger females from all socio-economic classes.

## **Conclusions**

The present study has shown that disgust properties only seem to apply to red meat varieties. The respondents also tended to attribute more negative terms to red meat, in contrast to chicken. Attributes and objects having offensive properties were features linked to the animal and parts of the animal, blood and raw meat, texture due to difficulties during chewing, fatty feeling in the mouth, and visible fat. These features were particularly mentioned by all the females. Negative associations that came up in the male group were based on distaste rather than disgust. Respondents with regular contact with farm animals displayed more relaxed attitudes towards animal production and attributed less disgust properties to meat and meat-eating.

Females tended to be concerned both about the way they felt following consumption, and the possible negative impact of meat on appearance. The females had no perception of the nutritional value of meat consumption, and had not foreseen the consequences of excluding red meat from the diet. The results showed that meat still occupies a position as a frequent consumed food for most of the respondents, but the structure of meat-eating was somewhat different for males and females.

The data based on our subjects’ attitudes, have produced some interesting results, though our sample is limited. There were clear gender differences throughout the discussions regarding associations of meat, but one should not rule out the possibility that apparent differences due to gender also could have arisen from regional differences in culture. In order to generalise and explore motivations for disgust-related attribution and rejections, our

findings should be further tested in more groups and aggregated data sets. The role of cultural representations should be further explored among adolescent consumers. Additionally, more research involving projective- and stimuli-based techniques is needed.

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# **A Study on the Mediating Role of Disgust with Meat in the Prediction of Red Meat Consumption among Young Females**

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## **Abstract**

Recent studies have examined young females' negative sentiments toward meat in the western world. This paper explored the role of factors that may trigger disgust with meat and hence avoidance of red meat among young females. These include negative body esteem, disgust motivations related to ideational concerns, sensory-affective concerns, and anticipation of negative consequences relating to the consumption of meat. The investigation showed that all of these factors were positively related to disgust with meat, and disgust with meat influenced red meat consumption negatively. It is hoped that this study will inspire researchers to explore the relationship between negative product emotions and consumer behaviour. Furthermore, the practitioners in the meat industry need to be aware of such barriers to the consumption of their products.

**Keywords:** Disgust with meat, meat eating concerns, negative body esteem, red meat consumption, negative product emotions, consumer behaviour



## Introduction

Eating food is an example of hedonic consumption, being rich in social and personal meaning, and associated with powerful emotions (Bourdieu, 1984; Rozin, 1999). Within the domain of food consumption, it is not sufficient to examine only the pre-purchase aspects of consumption. Specifically, this entails the inclusion of those aspects of consumer behaviour that relate to experiential consumption (Addis and Holbrook, 2001).

According to Hirschman and Holbrook (1982), emotional responses following the consumption represent the essence of the consumption experience. The role of emotional processes has been important variables in the study of consumer behaviour (Cohen and Areni, 1991). Researchers have for example investigated emotions generated by the use of specific products (Holbrook, *et al.*, 1984; Mehrabian and Wixen, 1986), or by services (Oliver, 1994). However, targeted and single product emotions like disgust as defined by Izard (1977), Plutchik (1980) or Lazarus (1991) are rarely seen in the marketing literature.

Of all the foods we consume, those of animal origin seem to have a special status in our diet (Pliner and Pelchat, 1991). Despite its privileged status as a favourite food, meat inspires ambivalence due to its association with living animals, blood (Guzman and Kjærnes, 1998), aggression, violence (Lupton, 1996), and deleterious effects on human health (Gregory, 1997; Worsley and Skrzypiec, 1998). A Norwegian market survey reported decreasing levels of confidence and trust in the Norwegian meat industry, and a rise in negative attitudes towards meat among females (Lien *et al.*, 1998). Recent studies have examined avoidance of red meat, particularly among young women (Kenyon and Barker, 1998; Kubberød *et al.*, 2002a; Santos and Booth, 1996; Worsley and Skrzypiec, 1997; 1998; Wright and Howcroft, 1992). Overall, these studies have addressed disgust with meat was an important issue, also among non-vegetarian females (Kubberød *et al.*, 2002a). Angyal (1941) followed by Rozin and Fallon (Fallon and Rozin, 1983; Rozin and Fallon, 1987) suggested that products of animal origin primarily motivate the emotion of disgust.

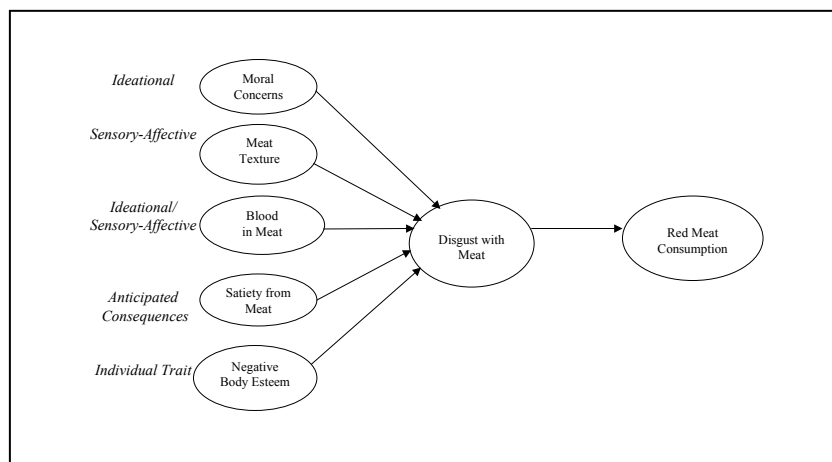
Lazarus (1991) argues that it is not the characteristics of the stimulus alone that determine a possible disgust response to animal products. Rather, it is the subjective appraisal of the stimulus that determines the emotion. Behind every emotion are hidden personal concerns, which can be regarded as the point of reference in the appraisal process (Frijda, 1986). According to Rozin and Fallon (1987), the concerns underlying disgust are of three types. The

first and primary type refers to ideational grounds. Specifically, it relates to the nature of the food, where it comes from, and what has happened to the food. The second reason for disgust is undesirable sensory-affective properties related to appearance, texture, smell or taste (bad tasting sensory concerns). The third reason for disgust is anticipation of negative consequences following ingestion of food. According to Lazarus (1991: 260), these three motivations together constitute the cognitive appraisals in the formation of disgust. They are also culturally determined (Rozin, 1989: 205-227). Accordingly, a better understanding of these concerns in relation to meat will facilitate the prediction of disgust.

This paper aims to contribute to the understanding of one particular negative product emotion rarely studied in consumer behaviour. The object of this study was to test the mediating role of disgust with meat in the prediction of meat eating concerns and negative body esteem on red meat consumption.

## Conceptualisation and Hypotheses

In this study we developed a set of hypotheses, which we subjected to empirical testing. The following sub-sections elaborate on the proposed relationship. The model we propose is displayed in Figure 1.



**Figure 1. The Conceptual Model**

### **Hypothesis 1:**

Moral concerns associated with the view that the consumption of animals is unethical have been one of the primary factors reducing the consumption of meat in western societies in the 1980s and 90s (Gregory, 1997). Several studies among young females have pointed at moral concerns for animals as relevant in abstinence from meat eating (Janda and Trocchia, 2001; Kubberød *et al.*, 2002a; Worsley and Skrzypiec, 1996; 1997). Rozin *et al.* (1997b) claimed that the most interesting aspect of moral concerns is their potential tendency to invoke strong emotional feelings like disgust. They found that moral vegetarians (based on ideational concerns related to the killing of animals) displayed more emotional reactions related to disgust with meat than those who avoided meat for health reasons. Based on this argument, the following hypothesis is proposed:

H1: Moral concerns related to animals will be positively related to disgust with meat.

### **Hypothesis 2:**

One sensory-affective trigger of disgust with meat (Rozin and Fallon, 1987) may be attributed to texture, particularly the tough and chewy texture of unprocessed meats (Kubberød *et al.*, 2002a). The dislike of fibrous texture seemed inversely related to the preference for processed meat with lower chewable resistance (Kenyon and Barker, 1998; Kubberød *et al.*, 2002a). Furthermore, adolescents may reject red meat, but they still eat processed meats (Wright and Howcroft, 1992). Based on this discussion we proposed the hypothesis:

H2: Sensory-affective concerns related to texture in unprocessed meat will be positively related to disgust with meat.

### **Hypothesis 3:**

The more the meat reminds us of the living animal, the more disgusting it is (Rozin and Fallon, 1987). The visual display of blood and the appearance of raw meat may be associated with the slaughter of a fellow creature (Elias, 1978; Twigg, 1979). According to Rozin and Fallon (1987), the mixture of both sensory and ideational concerns fall under the term offensive. Qualitative and quantitative inquiries have indicated that blood/redness may be a trigger of dislike and disgust with meat among teenage women (Kenyon

and Barker, 1998; Kubberød *et al.*, 2002a; 2002b; Santos and Booth, 1996; Worsley and Skrzypiec, 1997; 1998). Thus we expected that:

H3: There will be a positive relationship between ideational/sensory-affective concerns related to blood in meat and disgust with meat.

#### **Hypothesis 4:**

Meat has long been considered a “heavy” and satisfying food (Lupton, 1996: 107). This perception is particularly attributed to the feeling of fullness, sluggishness and sleepiness following consumption (Kubberød *et al.*, 2002a). Disgust may be realised from anticipation of negative consequences for the body, one such being the physical feeling of satiety (Rozin, 1989: 210; Rozin *et al.*, 1997a). In line with this discussion, we hypothesised the following:

H4: The anticipation of negative consequences due to satiety from meat consumption will be positively related to disgust with meat.

#### **Hypothesis 5:**

Traits related to the individual such as internalised values like self-esteem can also influence emotional response directly (Hirschman, 1999; Lazarus, 1991). In modern western culture, the importance of being thin has led many young females to express dissatisfaction with their bodies and to intensify dieting behaviour (Lupton, 1996; Thompson and Hirschman, 1995). Worsley and Skrzypiec (1997) reported sensory objections (which could be related to disgust), weight-loss behaviour and concern with body appearance among young female meat-avoiders. Mooney and Walbourn (2001) found that female meat-avoiders had greater weight-related concerns and disgust in response to meat than females who avoided other foods. Based on these recent findings, we suggested the following:

H5: There will be a positive relationship between negative body esteem and disgust with meat.

#### **Hypothesis 6:**

Shimp and Stuart (2004) found that disgust mediated the relationship between advertising content and purchase intent, suggesting there is a direct link between emotional experiences and behaviour (Hirschman, 1999). Red meats seem to have more associated disgust attributes than white meats

(Kubberød *et al.*, 2002a; Santos and Booth, 1996), and are the first meats to be excluded from the list of flesh foods (Twigg, 1979; 1983). In light of the trend indicating a greater incidence of resentment towards meat eating among young females in general, we are focusing on the influence of disgust upon red meat consumption specifically. Thus, we hypothesised the following:

H6: Disgust with meat will be negatively related to red meat consumption.

## **Method**

The conceptualisations were built upon basic findings from a qualitative inquiry among Norwegian teenagers (Kubberød *et al.*, 2002a). A postal survey questionnaire was used to test the hypotheses proposed, and Statistics Norway handled the data collection.

## **Subjects**

We selected subjects who covered a composite sample of adolescent female consumers at the critical age for reduced red meat consumption, between 15 to 18 years in age. Geographically, the region from which the participants were selected is considered a typical meat-eating area in Norway (Lien *et al.*, 1998). This area was selected in order to ensure that any disgust associated with meat would not be due to low availability of or unfamiliarity with meat in the diet. The sample was balanced to consist of a fifty-fifty representation of rural and urban respondents. The subjects (a total of 1345) were randomly selected by Statistics Norway. Four exemplars were discarded due to incompleteness, and the total sample of responses for analysis was 866 (corresponding to a return rate of 64.4%).

## **Questionnaire and Procedure**

All the variables were randomised in the questionnaires. Strict confidentiality of all responses was assured through Statistics Norway's regulations, and gift coupons were used to encourage participants to complete the questionnaire. The conceptual model is depicted in Figure 1, and the items selected are described in Table 1.

**Table 1. Measures Used in the Study**

Construct	Classification	Item	Cronbach Alpha
<b>Independent Variables</b>			
<i>Moral Concerns for Animals</i>	Ideational	I find meat production immoral** Meat production is a waste of resources I feel sorry for the animals that are slaughtered for our sake**	0.58
<i>Concerns related to Texture in Unprocessed Meat</i>	Sensory Affective	I prefer hamburgers to unprocessed beef I prefer hot dogs to unprocessed pork I find unprocessed meat hard to chew*	0.56
<i>Concerns related to Blood in Meat</i>	Ideational/ Sensory Affective	I don't eat meat if there is visible blood in it*  A steak should not have a red core <sup>a</sup> * The redder the meat the worse it tastes <sup>a</sup> *	0.74
<i>Concerns related to Satiety</i>	Anticipated Consequences	I get full quickly from meat*  I get sluggish after eating a steak* I must always relax after eating meat*	0.62
<i>Negative Body Esteem</i>	Individual Characteristic	I am often dieting <sup>a</sup> ***  I think I look too fat*** I am dissatisfied with my body shape***	0.79
<b>Dependent Variables</b>			
<i>Disgust with Meat</i>	Offensiveness Oral Discomfort/ Nausea Bad Taste	I feel that meat tastes disgusting I feel that meat builds up in the mouth <sup>b</sup> I feel that meat tastes bad <sup>a</sup>	0.65
<i>Red Meat Consumption</i>		Consumption frequency of pork Consumption frequency of beef Consumption frequency of lamb	0.56

<sup>a</sup>These items were reverse-coded.

<sup>b</sup>This item is directly translated from Norwegian, and is based on a typical linguistic norm of expression when one refers to the oral discomfort and nausea from meat being in the mouth. \*Adopted from Kubberød *et al.* (2002b). \*\* Adopted and modified from Worsley and Skrzypiec (1996; 1998). \*\*\* Adopted from Kubberød *et al.* (2002a).

## Operationalisation and Measurement of Variables in the Model

Seven of the items used in the study were pre-tested and applied in a quantitative study by Kubberød *et al.* (2002b). Furthermore, the items regarding negative body esteem were all adopted from the qualitative study by Kubberød *et al.* (2002a) and two items regarding morality and animals were adopted and modified from Worsley and Skrzypiec (1996; 1998), see Table 1. Additionally, a few new items were constructed for this study. All the items were checked by the staff in the research team for ambiguity, corrected and later pre-tested to screen wording. The pre-test was performed in a sample of fifteen female university students who belonged to the same population as the participants in the survey but were not involved in the main survey. After completing the survey, a reliability check was performed and four items were removed from the analysis due to their lower performance in describing their respective constructs (not included in Table 1).

The latent constructs, classification, and measures used in the model are displayed in Table 1. The constructs comprising the independent variable side of the model (see Figure 1) were measured by items rated on a 5-point Likert scale anchored with end points “completely disagree” and “completely agree”.

The first dependent variable, *Disgust with Meat*, intended to capture the respondents’ recalled and experienced feelings of disgust from meat consumption experiences (see Table 1). In Izard’s classic (1977), disgust is defined as a desire to move away from an object that is “spoiled”, “tastes bad” and “that leaves a bad taste in the mouth”, thus focusing on both the mouth and bad taste properties. According to Rozin and Fallon (1987), the oral sensations of discomfort, offensiveness and nausea are discussed as critical components in the feeling of disgust. In line with psychological theory, this paper focuses on the measurement of several facets of disgust related to meat: offensiveness, oral discomfort/nausea and bad taste. Three items intended to measure recalled feelings of disgust from meat-eating were developed for this study. These were measured on a 5-point Likert scale anchored with end points “completely disagree” and “completely agree”.

The second dependent variable, *Red Meat Consumption*, was operationalised by self-reported consumption frequency of red meats: beef, lamb and pork. The measurement of these items were performed using a 7-point category scale, labelled “do not eat at all”, “eat a few times per year or more seldomly”, “eat 3-6 times per year”, “eat 1-2 times per month”, “eat 1-2 times per week”, “eat 3-4 times per week”, and “eat almost daily”.

## **Data Analysis**

PRELIS in LISREL 8.54 (Jöreskog and Sörbom, 1996) with list-wise deletion was used in order to import the raw data and construct the covariance matrix. In addition, Cronbach's Alpha coefficients of internal reliability (performed in SPSS version 11.5) and confirmatory factor analysis (performed in LISREL 8.54) were assessed for the items intended to describe the constructs (sub-model).

The causal relationships between the latent construct variables were estimated by structural equation modelling (SEM) in LISREL 8.54. The covariance matrix and the Maximum Likelihood (ML) function were applied in order to estimate the parameters in the model. This estimation principle is independent of scaling, and the estimates are asymptotic and can be applied to large sample sizes (Bollen, 1989).

The theoretical relationships were evaluated using several criteria to determine the degree to which the overall model predicted the observed covariance matrix. Chi-square statistics, Root Mean Square Error of Approximation (RMSEA), Goodness of Fit Index (GFI) and Adjusted Goodness of Fit Index (AGFI) were calculated to assess the overall goodness of fit for the measurement model and structural equations.

## **Results and Findings**

### **The Goodness of Measures for Subsequent Modelling**

The reliability of the measures in the model is shown in Table 1. The Cronbach Alpha values ranged from 0.56 to 0.79. Cronbach Alpha should exceed 0.60, but lower values can be accepted for exploratory research (Hair *et al.*, 1998: 118).

The estimated standardised loadings for each item in the measurement model and their statistical significance are presented in Table 2. The goodness of fit indices are presented in Table 3.

The Chi-Square for the measurement model was 458.57 with 168 degrees of freedom. To overcome the vulnerability of the Chi-Square test to our large sample size, it is common to divide the Chi-Square value by the degrees of



freedom. As a rule of thumb, the resulting value should be less than 5 (Bredahl *et al.*, 1998). Our value on 2.73 provides satisfactory confirmation of model fit. The RMSEA value for our model was 0.05, which is considered acceptable, as the test requires values between 0.05 and 0.08 (Hair *et al.*, 1998: 656). Our results showed a GFI value of 0.95, and an AGFI value of 0.93 which qualifies as very good. Overall, the analysis suggested an acceptable fit between the constructs and measurement variables.

The measurement properties of the items in the model are presented in Table 2. The *t*-values for the factor loadings verified that all the variables were significantly related to their specified constructs, suggesting acceptable levels of convergence among items. The results also showed that some indicators were less good in their representation of their respective constructs.

The composite reliability was calculated for the proposed constructs to check whether the items were good measures of their constructs. In this study, construct reliabilities varied from 0.58 to 0.81. According to Bagozzi and Yi (1988), it should exceed 0.60, but this is not an absolute standard if the basis for the study is to investigate new predictions.

**Table 2. Measurement Properties of Measures in the Study**

Construct	Item	Construct Reliability	Standardised Loading	t-Value
<i>Moral Concerns for Animals</i>	I find meat production immoral	0.61	0.68	15.91
	Meat production is a waste of resources		0.65	15.47
	I feel sorry for the animals that are slaughtered for our sake		0.40	9.83
<i>Concerns related to Texture in Unprocessed Meat</i>	I prefer hamburgers to unprocessed beef	0.58	0.72	14.39
	I prefer hot dogs to unprocessed pork		0.56	12.44
	I find unprocessed meat hard to chew		0.39	9.37
<i>Concerns related to Blood in Meat</i>	I don't eat meat if there is visible blood in it	0.77	0.54	15.49
	A steak should not have a red core		0.91	25.39
	The redder the meat the worse it tastes		0.70	19.98
<i>Concerns related to Satiety</i>	I get full quickly from meat	0.64	0.42	10.54
	I get sluggish after eating a steak		0.73	15.57
	I must always relax after eating meat		0.66	14.69
<i>Negative Body Esteem</i>	I am often dieting	0.81	0.61	17.93
	I think I look too fat		0.95	28.38
	I am dissatisfied with my body shape		0.72	21.28
<i>Disgust with Meat</i>	I feel that meat tastes disgusting	0.68	0.68	19.06
	I feel that meat builds up in the mouth		0.50	13.45
	I feel that meat tastes bad		0.73	20.43
<i>Red Meat Consumption</i>	Consumption frequency of pork	0.59	0.66	16.18
	Consumption frequency of beef		0.70	16.90
	Consumption frequency of lamb		0.32	8.09

Note:  $p < 0.01$

**Table 3. Fit Statistics for the Measurement Model, n=866**

Criteria	Value
Chi-Square	458.57
Degrees of Freedom	168
Chi-Square/Degrees of Freedom	2.73
Root Mean Square Error of Approximation (RMSEA)	0.05
Goodness of Fit Index (GFI)	0.95
Adjusted Goodness of Fit Index (AGFI)	0.93

The correlation among the constructs used in the study is reported in Table 4. Low correlations ensure that the operationalised constructs are validly different from each other. Most of the correlations were below 0.32, and the proposed constructs can therefore be regarded as distinctly separate constructs. The constructs *Disgust with Meat* and *Red Meat Consumption* showed a higher correlation (-0.59). This is expected because they are related. Disgust is a food-related emotion, which deals with the emotional resistance against oral incorporation of potentially offensive items (Rozin *et al.*, 2000). Furthermore, *Moral Concerns Animals* exhibited a correlation of 0.53 with *Disgust with Meat*. According to Miller (1997:179), Rozin *et al.* (2000) and Scherer (1997), disgust and morality are highly correlated. Taking these considerations into account, we conclude that even though constructs may tend to be empirically similar, they are still of theoretical interest.

**Table 4. Correlations of Constructs in the Study**

		1	2	3	4	5	6	7
1	Disgust with Meat	1.0						
2	Red Meat Consumption	-0.59	1.0					
3	Moral Concerns	0.53	-0.32	1.0				
4	Satiety Concerns	0.18	-0.06	0.19	1.0			
5	Texture Concerns	0.31	-0.31	0.13	-0.03	1.0		
6	Blood Concerns	0.24	-0.21	0.11	-0.09	0.23	1.0	
7	Negative Body Esteem	0.17	-0.09	0.13	0.15	0.06	0.00	1.0

## Structural Model Evaluation

The structural model is illustrated in Figure 2. The fit statistics from the testing of the proposed relationships are presented in Table 5. The Chi-Square to degrees of freedom ratio was 2.72, which is evaluated as satisfactory. The RMSEA value of 0.05 is within the recommended interval. GFI and AGFI are 0.95 and 0.93 respectively, and are exceeding the recommended level of 0.90. We can therefore assume a good fit between the model and the data. According to the model results in Figure 2, all hypotheses were supported.

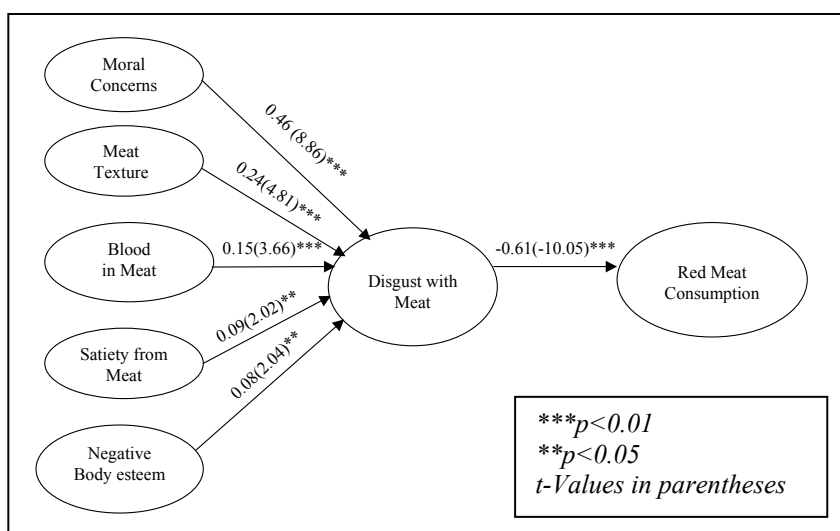


Figure 2. Structural Model with Regression Coefficients and t-Values

Table 5. Fit Statistics for the Model,  $n=866$

Criteria	Value
Chi-Square	469.81
Degrees of Freedom	173
Chi-Square/Degrees of Freedom	2.72
Root Mean Square Error of Approximation (RMSEA)	0.05
Goodness of Fit Index (GFI)	0.95
Adjusted Goodness of Fit Index (AGFI)	0.93

Note: Explained variance for the total model:  $R_{\eta_1}^2 = 0.39$   $R_{\eta_2}^2 = 0.37$

## Mediating Role of Disgust with Meat

To confirm that disgust with meat really mediates the effect of the independent variables on red meat consumption, mediation analysis in LISREL was performed. First we checked if the independent variables account for variance in the mediator (disgust with meat variable), and that the direction of the relationships was as expected. All of them were positively related to disgust, and the standardised coefficients ranged from 0.07 to 0.45. Furthermore, all the independent variables alone predicted red meat consumption in a negative direction (when mediator was left out of analysis). The last and critical step was to demonstrate that the effect of the independent variables on red meat consumption was mitigated (insignificant) when including disgust with meat together with all the independent variables in the prediction of the red meat consumption variable in the regression analysis. Our analysis revealed that the direct effect of the original independent variables became small in absolute size and insignificant (standardised coefficients ranged from -0.03 to -0.10), whereas the effect of disgust with meat remained significant (standardised coefficient was -0.64,  $t$ -value = -7.07). This analysis showed that the mediator disgust does carry influence of the independent variables.

## Summary of Findings

The summary of hypotheses and findings are listed in Table 6. Moral concerns associated with animals were shown to be the strongest predictor variable followed by concerns about texture, blood, satiety, and negative body esteem. The relationship between disgust with meat and red meat consumption was strongly supported. The independent side of the model explained 39% of the variation in disgust with meat, whereas disgust with meat described 37% of the variation in red meat consumption frequency.

**Table 6. Summary of Hypotheses and Key Findings**

Hypothesised Paths	Proposed Relationship	Results
Moral concerns for animals → disgust with meat (H1)	Positive	Confirmed
Texture in unprocessed meat → disgust with meat (H2)	Positive	Confirmed
Blood in meat → disgust with meat (H3)	Positive	Confirmed
Satiety from meat consumption → disgust with meat (H4)	Positive	Confirmed
Negative body esteem → disgust with meat (H5)	Positive	Confirmed
Disgust with meat → red meat consumption (H6)	Negative	Confirmed

## **Discussion and Implications**

In this study, we demonstrated that certain meat eating concerns and negative body esteem would predict disgust with meat and influence red meat consumption negatively among young females. Our investigation revealed that high moral concerns associated with the production and use of animals for food may motivate disgust with meat. Animals may thus become the central focus for intense emotions, even though the young consumers do not convert to a vegetarian lifestyle (Gregory, 1997). The experience of texture was another critical trigger for disgust with meat, possibly through its incorporation into the body through the mouth which is the critical point for further transformation (Rozin and Fallon, 1987). Blood in meat was additionally important, and Adams (1990) addressed an intriguing connection between female vegetarianism and menstruation. Meat and blood may be symbols of the changes that happen during this period of life and something that the girls find hard to cope with (Kenyon and Barker, 1998; see also Miller, 1997:14). The post-ingestional effect such as the feeling of satiety was found to be an important concern for the development of disgust with meat for the respondents, and this sensation may have a negative effect on future meat consumption. This study has addressed the relationship between negative female body esteem and disgust with meat. This is interesting in light of the degraded status of meat as a healthy food (Gregory, 1997; Janda and Trocchia, 2001; Kubberød *et al.*, 2002a), along with the fact that many avoidance behaviours related to food coincide with behaviours that focus on physical appearance and weight loss (Mooney and Walbourn, 2001; Worsley and Skrzypiec, 1997).

## **Limitations of the Study and Future Research**

The measurement model verified the factor and item structure of the model. However, we acknowledge that other items could increase the accuracy of the latent variables. Future applications and improvements of the model will have to include the development of a larger number of items in order to describe the constructs better and to increase the explained variance of the model.

No non-response bias check was performed on our data. According to Frankfort-Nachmias and Nachmias (1996; 200-201), a non-response bias check should be carried out if the return rate is low and if one can expect that the non-response sample mean differs much from the sample mean of the

responses. We consider this threat of non-response bias to be minimised since the return rate was fairly high, the data collection accounted for cultural backgrounds (only Norwegian-born females were surveyed). Furthermore, the segment was restricted in age and was limited to females, and Norway is considered to have a relatively homogenous population.

One particular issue worth addressing is that teenagers aged 15-18 still live with their parents. Even though they may be disgusted by meat, this may not be reflected in their reported consumption pattern. Meat may be hard to avoid under parental influence (Kubberød *et al.*, 2002a; Worsley and Skrzypiec, 1998), and this fact may account for the standardised coefficient in the path between disgust and meat consumption for not being higher than -0.61 in our study. Other factors that can intervene with the modelled relationships would be of particular interest for later studies.

Deliberate rejection of certain foods such as red meat may illustrate a strong will and use of self-discipline to achieve control over weight and shape and ultimately physical attractiveness (Thompson and Hirschman, 1995). We encourage researchers to explore the role of meat avoidance as a potential marker for this “dark side of food consumption” in future research.

### **Contributions to Theory and Marketing Practice**

In the marketing literature, anti-consumption activities have attracted little attention, but the less apparent role of products that are deliberately avoided may be equally important (Englis and Solomon, 1997). This paper has attempted to expand the traditional focus on emotions in the consumer behaviour literature, and it seeks to make a contribution to the study on negative product emotions. This study has demonstrated that disgust mediates the effect of the meat eating concerns and negative body esteem on red meat consumption. This is an important contribution, in light of the fact that marketing and consumer behaviour has almost neglected this emotion in research (see Shimp and Stuart (2004)). One contribution to the disgust theory is that we have provided a specific food-related context for studying this emotion.

The first and overall implication of this study is that modern food producers have to look upon themselves more as designers of experiences, and not just producers of commodities. Generally, the meat industry are not longer selling pieces of carcasses or animals, but must try to minimise the ideational cues that make the consumers think back to how the animal lived and died.

Instead the focus should be set on appealing features that make the consumers think forward to the finished meal.

Tailoring product and communication for the “critical” female segment is crucial, due to the fact that females still hold the primary position as decision makers with regard to food choices made within the households. The segment of young females thus represents a social barometer for future meat consumption.

For example, the disgust associated with animal stimuli should encourage product developers to present meat products that are less ‘meat-like’ in appearance. On the physical attribute level, constant focus on methods to reduce hard texture is a critical issue for the meat industry (Sivertsen, *et al*, 2002). Furthermore, visible blood in meat and red colour are clearly critical attributes that need to be controlled in the display of fresh meat (packaging) and in the market communication content. Increased focus on innovation of new products should bring about market opportunities that have not been fully exploited by the meat industry. Developers should take the opportunity to increase focus on development of new products such as processed meat products, marinated products to increase tenderness and manipulate colour, ready-to-cook /semi-prepared meals, and small product cuttings that can be dropped directly in the pan. Overall, the products should be possible to use in a dish without too much prior preparation such as cutting and cleaning, to prevent the consumers from exposure of blood and other animal reminders. In line with Shimp and Stuart (2004) we also suggest that the managers involved in product development and market communication of animal derived foods should routinely include measures of felt disgust in testing of their products and commercials.

Bearing in mind the negative health aspects and consequences to their bodies that females in particular attribute to meat, focus should be placed on how meat can be presented without connotations of fullness or fat content. Marketers might seriously consider the portion size of meat, due to the fact that young women tend to associate meat with “heavy” food, having negative impact on their stomach feel. Advertising and product development of meat should offer relatively tiny portions of red meat, perhaps in conjunction with other foods with a high health profile. In this respect we dare to propose a renewal of the association of health with meat. Food classifications tend to change over time (Lupton, 1996), and in the western industrialised part of the world there is nowadays an ongoing reinterpretation of the understanding around health and food. The debate has now turned its focus onto carbohydrates as having negative impact on weight and health, and the advantage of a high protein diet is increasingly promoted. This



information may be utilised as a marketing advantage in communication of meat as a high protein, and hence a healthy, food product.

Our research is limited to the younger generation, which probably represents inexperienced consumers with respect to knowledge about animals, animal production and meat preparation. However, one might expect that the threshold for disgust with animal derived food will probably be lower as the society becomes more urbanised, and the fact that fewer and fewer people acquire first hand experience with animals and animal handling (Shimp and Stuart, 2004). Hopefully, this study has contributed to increasing the knowledge platform on how the animal producing industries can comply with specific tastes and attitudes of critical consumer segments when it comes to development, presentation, and market communication of meat products.

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## **Gender specific preferences and attitudes towards meat**

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*Received 20 August 2001; received in revised form 10 February 2002;*

*accepted 22 March 2002*

### **Abstract**

Recently, red meat avoidance has shown an increase in the industrialised countries, especially among young female consumers. Sensory factors as bloodiness in meat, difficulties coping with eating a fellow animal, and private body concern appear as the main reasons for red meat exclusion. The study addressed whether sensory attributes in meat are linked to attitudes and beliefs about meat. Based on previous studies, the expectation that red meat is linked to dislike and negative attitudes among young females was tested. The study used a quantitative approach, applying both a quantitative sensory profiling with trained panellists and a consumer study with a convenience sample. The trained sensory panel evaluated 22 sensory attributes of five meats, ranging from red (beef) to white (chicken) meat varieties. Comparable samples of the same meat varieties were served in randomised order to 206 young consumers, males and females between the ages of 14 and 30 years, in a blind preference test. Beliefs and attitudes towards meat-eating, and desired change in consumption frequencies of flesh products were also collected. Consumers preferred the white meat (chicken) to the red meats. The mean hedonic rating of meat decreased progressively as the meat increased in red colour intensity and typical meat flavours, and this was particularly evident for females. Females displayed, in contrast to males, significantly lower mean hedonic scores for the reddest meat varieties, i.e. ostrich, lamb and beef. Males displayed, compared with females, also a significantly higher attitudinal support for “pro-red meat” statements.

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The results were strengthened by significantly higher desired increase in consumption frequency of beef among male consumers. The link between consumer and product was established and revealed a close relationship between specific sensory attributes of meats and consumer attitudes towards meat. For example, sensory attributes related to white meat were correlated with negative attitudes towards red meat. The hypothesis that dislike of red meat varieties is more prevalent among females was supported. © 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Consumer; Preference; Dislike; Red meat; Sensory; Hedonic rating; Gender; attitudes; Meat map; PLS

## **1. Introduction**

Traditionally, meat has been considered an important ingredient in the Western food culture and it has been associated with “the proper meal” (Charles & Kerr, 1988; Lupton, 1996). Meat is an important provider of protein and iron and has therefore been considered essential for good health. Red meat, as a high-energy type of food, is considered appropriate for men and symbolises strength, power, and typical values related to the masculine identity (Adams, 1990; Bourdieu, 1984; Lupton, 1996; Twigg, 1983). However, during the last half of the twentieth century diseases connected to lifestyles have increased in the Western world. The relationship between constituents in the diet and health has been established, especially between saturated fat in animal products, illness and weight.

Furthermore, despite meat’s traditionally high status as proper food, meat has connotations of ambivalence by its link to the living animal, slaughter, blood (Guzman & Kjærnes, 1998), aggression, and violence (Lupton, 1996). Meat is therefore an example of food that embodies negative associations in the Western world today. These negative associations have been, and probably will be, further strengthened due to the constant debate and fear around hormones, mad cow disease, and now the recent outbreak of foot-and-mouth disease.

During the 1980s and 1990s novel attitudes towards meat have evolved and consumption of red meat is declining among particularly the younger females in the industrialised countries (Gregory, 1997). Richardson, Shepherd, and Elliman (1993) showed that in the UK twice as many married females were semi-vegetarian compared with males, and three times as many single females were semi-vegetarian compared with men in the same life situations. Studies, both in the UK and Australia, have shown development towards meatless eating especially among young teenage women (Kenyon & Barker, 1998; Santos & Booth, 1996; Worsley & Skrzypiec, 1997, 1998).

Santos and Booth (1996) and Worsley and Skrzypiec (1998) both found that females, in contrast to males, tended to avoid red meats and replace with chicken.

Although meat consumption in Norway has not followed the downward trend as seen in other western countries, studies have shown that Norwegian females do have more restrictive attitudes towards meat (Lien, Bjørkum, & Bye, 1998). Whether such restrictive attitudes will lead to a decline in consumption of red meat in Norway, as seen in other industrialised countries, remains to be seen.

Restricted meat consumption may be motivated by several factors; some may be rooted in religion and ideology (Dwyer, 1991; Sims, 1978). However, traditional beliefs and priorities such as ethical, ecological and health concerns are not the main reasons young female consumers mention for avoiding flesh foods. Dislike with meat and sensory factors, disgust with blood and raw meat, difficulties with divorcing the meat concept from the living animal (Kenyon & Barker, 1998; Santos & Booth, 1996), and body and weight concern (Ryan, 1997; Worsley & Skrzypiec, 1997) have frequently appeared as females' main reasons for adapting to meatless eating. The physical characteristics of the food such as taste, smell and texture are therefore important for determining meat rejection. A negative reaction to meat, both sensory and emotionally, could be developed from the idea that presence of blood and appearance of raw meat can be associated with slaughter and death of animals (Elias, 1978; Twigg, 1979). This experienced offensiveness, the so-called disgust reaction, refers to the concrete characteristics of meat and also to the subjects' interpretation and conceptualisation of them (Rozin & Fallon, 1987). A qualitative study among young females found that sensory drivers of dislike and disgust with meat were especially the appearance of blood and raw meat, but also chewy texture and fattiness (Kubberød, Ueland, Tronstad, & Risvik, 2002). The study further revealed that females tended to associate meat with "heavy" food weighing on their stomachs. A resistance towards consumption and nausea associated with specific objects may also be rooted in disgust with meat (Rozin & Fallon, 1987).

No study has yet addressed whether attitudes and beliefs about meat are linked to specific sensory attributes, such as redness. The primary scope of this study has been to explore this relationship quantitatively. We hypothesise that red meat sensory attributes are linked to dislike and negative attitudes among young female consumers. The fact that most of the teenagers still live with their parents may influence and restrict the food choices of the young consumers (Beardsworth & Keil, 1991; Kubberød et al., 2002). However, young dependent persons' intentions to eat may indicate future consumption among adult independent persons. We have not found any studies that compare intentions to eat with actual sensory



preferences. Our secondary aim is therefore to investigate young consumers' beliefs about their future meat consumption in order to interpret consequences of attitudes and preferences.

## **2. Material and methods**

The study consisted of two main parts, a conventional sensory profiling of five meats using a trained panel (the objective part) and a consumer survey. The meat samples selected were commercially available meats of comparable, most desirable, and tender parts of the following meat varieties: beef, pork, lamb, ostrich, and chicken.

### *2.1. Study 1—sensory analysis as judged by the sensory panel—the sensory meat map*

To obtain an objective meat reference for the study a trained sensory panel of eleven panellists used Quantitative Descriptive Analysis (ISO 6658-1985-Methodology General guidance) to evaluate the meat samples. The panellists had from 4 to 20 years of experience in sensory profiling. The evaluations were performed in a laboratory facilitated according to ISO 8589-1988.

Samples were coded with three digit randomised numbers and served in random order according to sample, replicate and assessor. The samples were preheated in a water bath and served to the panellists at 65 °C on white plastic plates.

The assessors developed a test vocabulary by describing differences between samples and agreed upon a consensus list of attributes for profiling and on the definition of each attribute. In a pre-test session the assessors were trained in the use of the scaling anchors by testing samples that were believed to be extreme on selected attributes.

The panellists evaluated the samples at individual speed for 22 attributes, using a 15-cm unstructured continuous scale, where the left side of the scale corresponded to “low intensity” and the right to “high intensity”. The attributes employed for evaluations are listed in Table 1. The odour of the samples was immediately assessed after the opening of the plastic bags. Colour was assessed on a fresh cross-section of the sample. Odour, flavour and texture attributes were assessed on the entire sample. The main evaluation consisted of nine replicates per meat variety. Five samples were tested during each session. For further methodological details we see Rødbotten, Ueland, Kubberød, and Lea (2001).

Table 1  
Assessed sensory attributes

Attribute	Definition
<i>Odour</i>	
Intensity	Intensity of sum of all odours
Odour of sweetness	Odour of sugar
Odour of fruit acid	Odour of fruit/fresh and sour/sweet
Metallic odour	Odour of Ferro sulphate
Liver odour	Odour of animal liver
Gamy odour	Odour of wild animal
<i>Colour on the fresh cross-section</i>	
Whiteness	Pale, no colour
Colour hue	Yellow/red to red/blue
Colour intensity	Clear, strong colour
<i>Taste and flavour</i>	
Taste intensity	Intensity of sum of all flavours
Sweet taste	Flavour of sugar
Acidic taste	Flavour of fruit/fresh and sour/sweet
Bitter taste	Flavour of quinine and other bitter substances
Metallic flavour	Flavour of Ferro sulphate
Liver flavour	Flavour of animal liver
Gamy Flavour	Flavour of wild animals
Off-flavour	Sickening sweet off-flavour
<i>Texture</i>	
Coarseness	Degree of granularity of the muscle fibres
Hardness	The force required to bite through the sample
Tenderness	Time and numbers of chewings required to masticate the sample ready for swallowing
Fattiness	Fatty feeling in the mouth and gum
Juiciness	Perception of water content in the sample after 3-4 chewings

The results were recorded on a computer registration system (CSA, Compusense Five, Version 4.0.236, Canada, 1999). The computer transformed the responses into numbers between 1.0 (= low intensity) and 9.0 (= high intensity).

## 2.2. Study 2—consumer study

A convenience sample of 206 respondents were recruited at an exhibition for education at the Agricultural University of Norway. The participants consisted mainly of secondary and high-school students aged 14 years and older from two counties situated in the south eastern part of Norway. Self-selection was minimised as practically everybody that was asked volunteered to participate in the study, and the stand was located in such a way that everybody had to pass the recruiters. The respondents were asked to fill in a

questionnaire and to taste five meat samples. The description of the consumer sample is presented in Table 2.

Table 2  
The gender and age distribution of the subjects

Gender and age of subjects	Total%	(N)
<i>Gender</i>		
Females	52.4	(108)
Males	47.6	(98)
Total	100	(206)
<i>Age</i>		
10-14	23.3	(48)
15-19	60.7	(125)
20-24	6.3	(13)
25-29	9.7	(20)
	100	(206)
Mean age		16.9

The questionnaire consisted of the following themes relevant for this study:

1. Desired change in consumption frequency.
2. Attitudes towards meat.
3. Hedonic rating of meats.

The first part of the questionnaire contained desired change in consumption frequency for meat varieties and processed meat products measured on a seven-point bipolar scale ranging from “desire to reduce a lot” to “desire to increase a lot”, with an anchored midpoint; “wish no change”.

The second part of the questionnaire consisted of 33 attitudinal questions related to meat, with emphasis on sensory attributes. The items were rated on a five-point Likert scale anchored with endpoints “completely disagree” and “completely agree”. Some of the items concerning meat and meat-eating were adopted and modified from the “anti meat” items of Worsley and Skrzypiec (1997). The items concerning sensory attributes and body feel associated with meat-eating were generated through group interviews (Kubberød et al., 2002).

Subsequent to the first two parts a meat tasting session was conducted, which included hedonic rating of five meat samples (blind test). The consumers evaluated the samples for overall liking on a nine-point hedonic scale anchored “dislike extremely” and “like extremely”. The questions and

samples were coded with three digit random numbers and presented in a randomised order. No information about the samples was provided.

### 2.3. *Statistical analysis*

The following statistical techniques were employed in the statistical analysis: principal component analysis (PCA), partial least squares regression (PLS 1 /PLS2), and independent-samples t-test. PCA was employed to study the main variation in the sensory variables, using full cross validation on the panel averages. No weighting was applied to the data. Variables containing no systematic or reliable information were eliminated through a t-test of the uncertainty of each variable's loading on each component. In the cross validation, the model based on all samples was compared to the model from each cross validation segment. For further details see Westad (2000).

PLS2 regression was employed to study the relationship between the sensory panel data and the consumers' hedonic ratings, one of several so-called preference mapping techniques (Helgesen, Solheim, & Næs, 1997; McEwan, 1996). The PLS-components of the sensory matrix were used to predict systematic variation in the consumer liking data. Mean male and female hedonic ratings were the variables to be predicted. Due to common scales used for both data matrices, no standardisation, except centring of the data was performed. Full cross validation and jack-knifing was applied. For further statistical details concerning this method see Martens and Martens (2000).

To investigate the relationship between the sensory meat map (sensory characteristics and the meat samples), consumer hedonic ratings and attitudes related to meat the following procedure based on PLS regression was employed (Martens, 2001, personal communication):

1. PLS2 regression was run with consumer attitude items as X -matrix and consumers' hedonic ratings of the meat varieties as Y -matrix. The analysis was run with full cross validation and variable selection by jack-knifing, in which two components were found to be the optimal model rank for interpretation.
2. Significant X -variables were selected and a second PLS2 regression analysis was run on the reduced data set.
3. The regression coefficient matrix (B) was extracted as the data that combined attitudes with sensory liking of the five meat varieties.
4. A new PLS2 regression analysis was run with the panel averages from sensory analysis of meats as X -matrix and the regression coefficient matrix (B) from step 3 as Y -matrix. The analysis was run with full cross validation and variable selection by jack-knifing. In this way the link

between consumer attitudes and physical product attributes was established. A correlation loading plot was used for showing the overview of the relationship between the sensory meat map and the hedonic linked attitudes. A plot of correlation loadings displays the correlation between each variable and the components regardless of how the variable was weighted in the modelling stage. The five meat varieties were included in the analysis as dummy variables, i.e. variables weighted down with a factor 10 000 to set their influence in the model close to zero. In the plot of correlation loadings, these variables were visualised together with the other variables. By this method we are able to convey information about the samples and variables in one plot.

An independent-samples t-test was applied to investigate potential significant differences in mean responses for males and females. The following variables were subjected to the t-test: Hedonic ratings of different varieties of meats, desired change in consumption frequency of selected flesh products, and attitudes towards meat-eating.

The PCA and PLS computations were carried out using Unscrambles version 7.5 and 7.6 (Camo ASA, Trondheim, Norway). The t-tests were performed in SPSS for Windows, version 10.0 (SPSS Inc., Chicago, USA).

### 3. Results

#### 3.1. Descriptive sensory data—the sensory meat map

The first principal component from PCA of the sensory data described 77% of the variation in sensory properties of meats. Most of the interpretable variation could be described along the first principal component (PC 1). Adding a second component increased the explained variance to 92%.

From Fig. 1(a), PC1 appeared to be strongly related to the colour attributes, ranging from white and without colour in the left-hand side of the plot to stronger intensity in colour and loss of whiteness in the righthand side of the plot. All the colour attributes were significant on PC 1. In addition, most of the flavour and odour attributes, such as liver flavour and odour, gamy flavour and odour, sweet taste and odour, off flavour, acidic taste, and odour of fruit acid were related to and significant on the first component. Taste intensity, bitter taste, metallic odour, and metallic taste were not significant attributes for the model.

The second component (PC2) described an accumulated rest variance for the attributes related mainly to texture, ranging from the attribute tender at the top of the plot and coarseness and hardness at the bottom. Fattiness and juiciness were not significant attributes and were found in the middle of the plot, which indicated low variation in mean values among the meat samples.

The distribution of the meat samples in the sensory space of attributes is shown in Fig. 1(b). Beef and ostrich were described by PC1 as being high in colour intensity and low in whiteness, while lamb and pork were described by lower colour intensity and increasing whiteness. Beef and ostrich were also characterised by relatively strong intensities of most of the flavour and odour attributes. Chicken had lowest intensity ratings on these attributes.

Pork and beef were explained by PC2 as being the least tender, most hard and coarse samples.

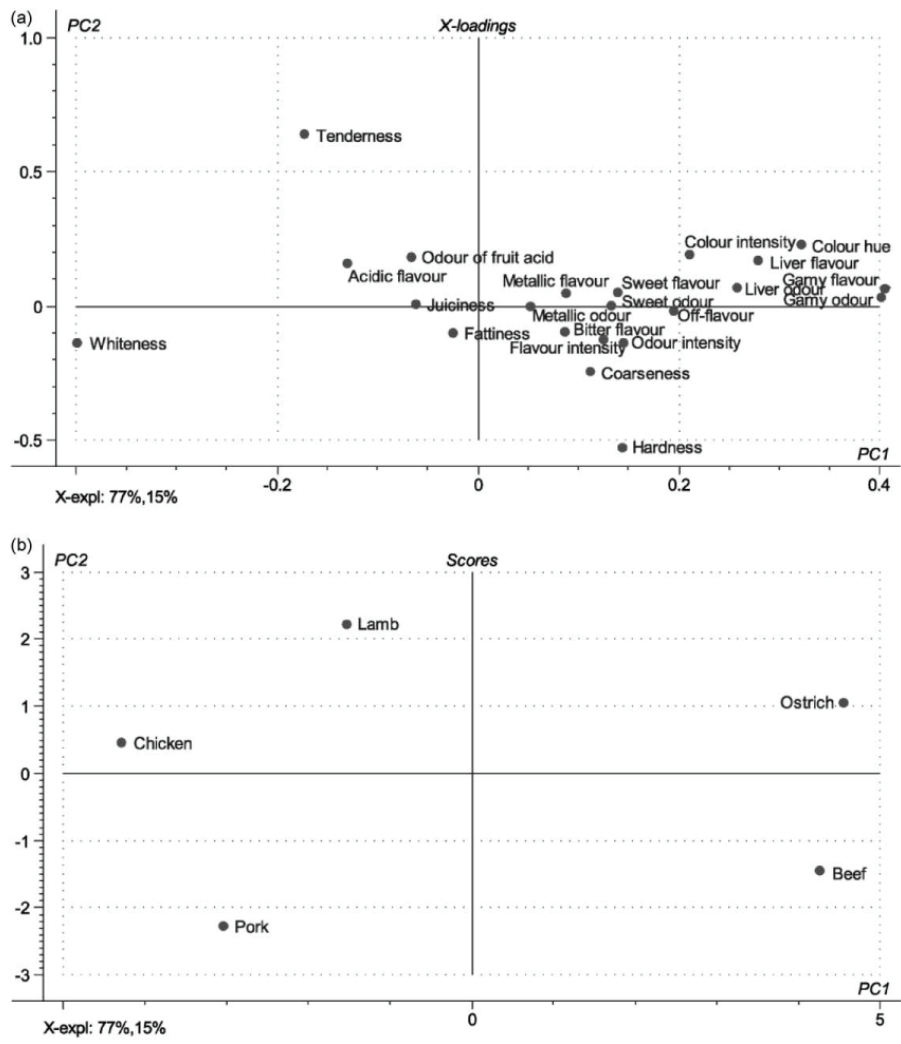


Fig. 1. (a) Relationship between sensory meat attributes; (b) Distribution of meat samples within the sensory space.

### 3.2. Hedonic ratings and the sensory meat map

The direction of the average female and male consumer preferences for meat attributes are illustrated in the loading plot in Fig. 2. The two first PLS components related to sensory attributes described about 98% of the variation in the preference data, but almost all of the variation could be related to the first component.

The consumers preferred the white meat (chicken) to the red meats, but the average female preference correlated more with attributes related to the whiter meats, i.e. whiteness and acidic taste. Mean male preference, however, showed a slightly stronger correlation to attributes of stronger intensity in typical red meat odours/flavours and colour intensity. The second PLS component explained only 2% of the variation in average preference related to texture. Females displayed, in contrast to males, significantly lower mean hedonic scores for lamb, ostrich and beef

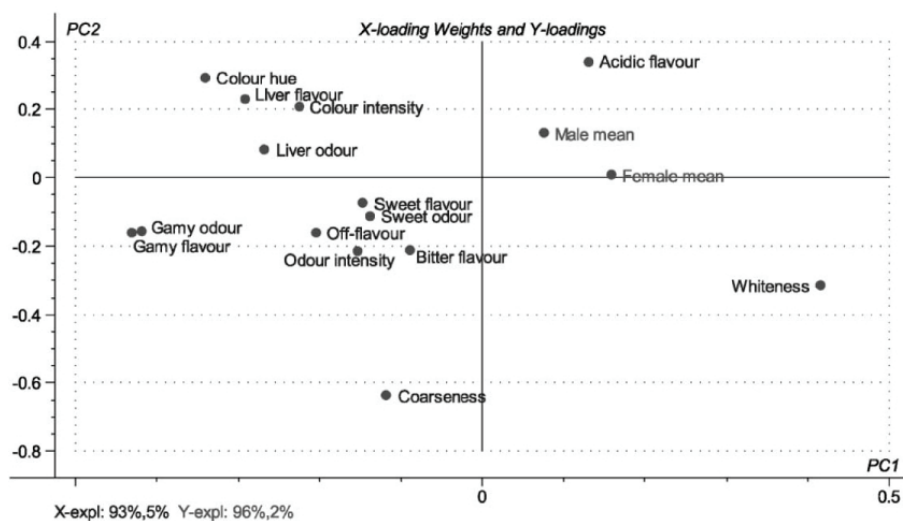


Fig. 2. External preference map obtained by PLS2 regression of descriptive sensory data and mean consumer hedonic ratings (males and females).



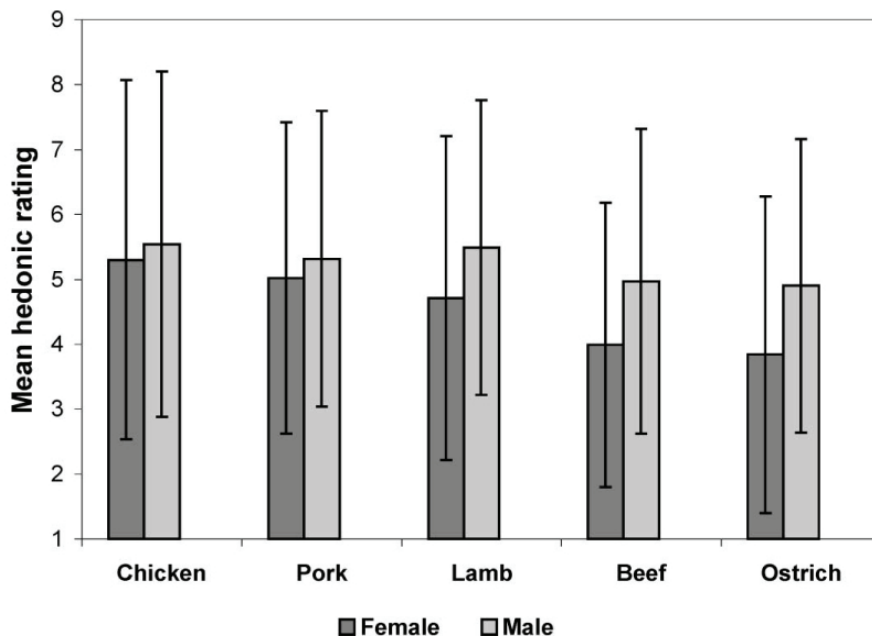


Fig. 3. Mean hedonic ratings of meats.

( $P < 0.05$ ). Males displayed generally less variation in hedonic scores, and they gave, relative to females, higher scores for all meat varieties, see Fig. 3. The male range between maximum and minimum mean hedonic score was 0.64, in contrast to 1.46 for females.

### 3.3. Attitudes towards meat

Gender differences in attitudes are presented in Table 3. Females were, compared with males, significantly more positive to statements such as “I don’t eat steak if there is visible blood in it” ( $P < 0.01$ ) and “I prefer to eat vegetables to meat” ( $P < 0.001$ ). Males, however, displayed significantly higher support for statements such as “nothing satisfies my appetite better than a steak” ( $P < 0.001$ ), “I feel comfortable after eating meat” ( $P < 0.001$ ), “I feel fit after eating meat” ( $P < 0.001$ ), “I love to eat beef” ( $P < 0.05$ ), “In my opinion a steak should have a red core” ( $P < 0.001$ ), “The redder the meat the better it tastes” ( $P < 0.001$ ), and “I enjoy the smell of raw meat” ( $P < 0.01$ ).

Table 3  
Estimates from t-test of the attitudes towards meat-eating<sup>a</sup>

Item <sup>b</sup>		Mean	S.D.	P
I feel that meat is easy on my stomach	Female	2.23	0.97	0.002
	Male	2.68	1.06	
I feel comfortable after eating meat	Female	2.10	0.90	< 0.001
	Male	2.65	1.18	
I feel fit after eating meat	Female	1.68	0.83	<0.001
	Male	2.29	1.03	
I feel that meat is easy to digest	Female	2.38	1.10	0.004
	Male	2.82	1.00	
I don't eat meat if there's visible blood in it	Female	3.00	1.58	0.006
	Male	2.40	1.48	
I enjoy the smell of raw meat	Female	1.66	1.08	0.001
	Male	2.25	1.41	
In my opinion a steak should have a red core	Female	1.96	1.30	<0.001
	Male	2.74	1.45	
The redder the meat the better it tastes	Female	2.15	1.26	< 0.001
	Male	2.83	1.43	
I think that roasted meat looks appetising	Female	3.89	1.28	0.029
	Male	4.25	1.06	
I love to eat beef	Female	3.01	1.18	0.024
	Male	3.40	1.23	
Nothing satisfies my appetite better than a steak	Female	2.38	1.25	< 0.001
	Male	3.26	1.29	
I prefer to eat vegetables to meat	Female	2.60	1.43	<0.001
	Male	1.85	1.16	

<sup>a</sup> Scale ranging from 1 to 5.

<sup>b</sup> Only significant items are included in the table.

### 3.4. Correlation between the sensory meat map and hedonic linked attitudes

The plot of correlation loadings in Fig. 4 displays the relationship between the sensory meat map as assessed by the panellists, and the hedonic linked attitudes as evaluated by the consumers. Eighty-one per cent of the variation in the two first PLS components related to sensory attributes explained 89% of the variance in attitudes. Generally, the first component was related to colour, flavour, and odour. The second component was mainly related to texture. The consumer attitudes were distributed in the following way: “Pro-red meat” statements were located on the right-hand side of the plot and “anti-red meat” statements on the left. Chicken and attributes related to white meats, such as whiteness, acidic taste/odour, and partly tenderness were correlated with statements such as “I hate to eat beef”, “I don't eat meat if there's visible blood in it”, “I feel slack after eating a steak”, and “I feel

more slack after eating beef than chicken”. Beef, ostrich and related attributes such as red colour intensity, coarseness,

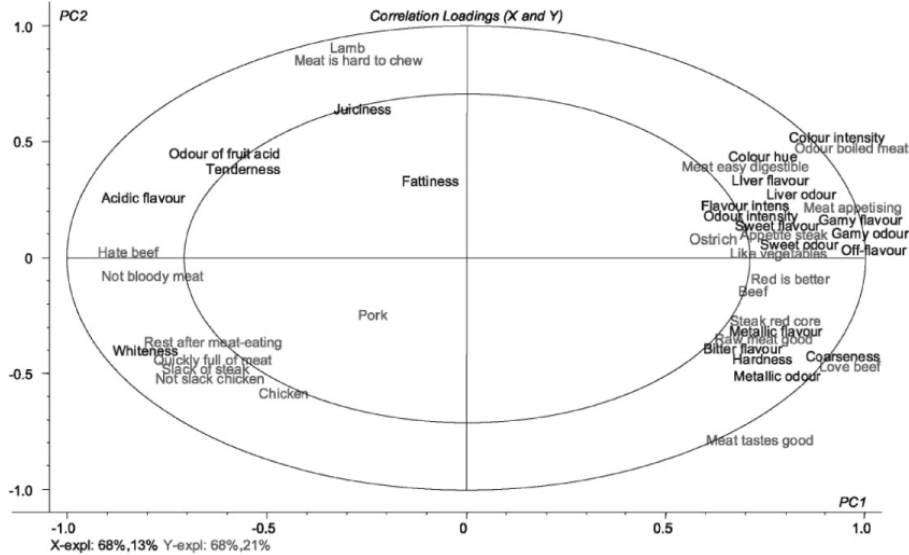


Fig. 4. Plot of correlation loadings displaying correlation between the sensory meat map and hedonic linked attitudes. Inner and outer dotted ellipsoids represent 50% and 100% explained variance, respectively.

hardness, and red meat odour/flavour attributes were located on the right-hand side of the plot. Beef and ostrich were correlated with statements such as “I love to eat beef”, “I enjoy the smell of raw meat”, “In my opinion a steak should have a red core”, “The redder the meat the better it tastes”, “Meat is easily digestible”, “Nothing satisfies my appetite better than a steak”, and “I think that meat tastes good”. Lamb was situated at the top of the plot due to the tender and juicy character of the meat, and was correlated to the statement “I feel that meat is hard to chew”. Pork contributed less in spanning the meat “space”.

Table 4  
Estimates from t-test of the desired change in consumption frequency<sup>a</sup>

	Mean	S.D.	P
<i>Pork</i>			
Female	0.06	1.19	0.581
Male	0.16	1.39	
<i>Hamburgers</i>			
Female	-0.12	1.40	<0.001
Male	0.79	1.60	
<i>Lamb</i>			
Female	0.05	1.49	0.100
Male	0.40	1.54	
<i>Beef</i>			
Female	0.07	1.00	0.014
Male	0.51	1.45	
<i>Chicken</i>			
Female	0.61	1.41	0.241
Male	0.84	1.41	
<i>Sausage</i>			
Female	-0.24	1.92	0.013
Male	0.24	1.79	

<sup>a</sup> Bipolar scale ranging from -3 to 3.

### 3.5. Desired change in consumption frequency

Males displayed, in contrast to the females, significantly higher desired increase in consumption frequency of beef ( $P < 0.05$ ), see Table 4. For processed meats such as sausages and hamburgers there were also significant gender differences; females reported a desire to reduce their consumption of such products, but males wanted an increase in the consumption frequency.

## 4. Discussion

### 4.1. Sensory meat map and consumer hedonic ratings

The development of a sensory meat map from different species established an objective reference frame and made it possible to explore differences in consumer preferences for different meat varieties simultaneously. Parallel results from Rødbotten et al. (2001) have shown that it is possible to establish general descriptors used in sensory profiling of different types of

meat. The result from our meat map revealed the colour attributes as important characteristics describing most of the variation between the selected meats, followed by flavour, odour, and then texture.

The consumers preferred the white meat (chicken) to the red meats. The mean hedonic rating of meats decreased progressively as the meat increased in red colour intensity and typical meat flavours, and this was particularly evident for females. These results were further supported by females' significant lower mean hedonic ratings of the reddest meat varieties, i.e. ostrich, lamb, and beef. When relating consumers to the sensory space of meat attributes only 2% of the variation in preference could be explained by attributes related to the texture dimension. This implies that texture was less relevant for interpretation compared with other attributes in this study.

Our observations of female hedonic scores show interesting parallels to the theoretical "meat avoidance hierarchy" (Twigg, 1979). Red meats, especially beef, have the highest status for true meat lovers, but are the kind of foods that are first avoided by those who display scepticism towards meat-eating. Twigg hypothesised that the idea of the origin of meat, the appearance of blood and redness are the key features, which explain the creation of the meat resentment. Others have further claimed that white meat such as chicken, due to the meat's white appearance, is most often chosen, and therefore is less likely to be associated with blood or a living animal (Gregory, 1997; Guzman & Kjærnes, 1998). Another explanation of chicken's popularity is the fact that chicken may be viewed as a less sentient being compared with animals like mammals. The nature of being less of a personified animal makes chicken easier to consume (Worsley & Skrzypiec, 1998).

#### *4.2. Gender specific attitudes and preferences towards meat eating and the relationship between meat attributes and attitudes*

The physical characteristics of food are important factors for determining the emotional response it evokes. In this study we found a close relationship between sensory attributes of meat and consumer attitudes, supported by the majority of variables explaining between 50 and 100% of the variation in the correlation loadings plot. Attributes related to colour, i.e. degree of bloodiness in meat were the most significant attributes explaining attitudes towards meat. Generally, the sensory product attributes that correlated with negative attitudes towards red meat were related to typical white meat attributes. Likewise, sensory attributes that correlated with positive attitudes towards red meat were related to typical red meat attributes. These results further confirm the fact that consumers, who displayed scepticism against red meat, also preferred chicken to red meats. Only one attitudinal statement

related to texture was found significant, meaning that the consumers' hedonic ratings were less consistent regarding texture.

Males displayed, in contrast to females, significantly higher attitudinal support for statements related to "pro-red meat" items, such as those related to bodily pleasure associated with meat-eating, hedonic pleasure of eating red meat, and degree of bloodiness in meat. These results could reflect that females experience discomfort when eating meat due to the sensation of blood and perceived body feel accompanied with meat-eating. According to results from qualitative studies, young female respondents reported meat to be hard to digest, "weighs up your body", and the sight of blood was found repulsing (Kenyon & Barker, 1998; Kubberød et al., 2002). Our findings are further confirmed by Lupton (1996) who reported that females preferred food that was easy to digest and that red meat was typically an archetype of heavy food having a negative effect on the female body (Lupton, 1996). Adolescence is a period in life when each individual has to find a sort of balance between the need for self-expression and to satisfy needs of others in their environment (Epstein, 1994). In a search for this balance, the young females may want to depart from social structure, moral and norms, just to symbolise a differentiation from the adults in their family. According to Fürst (1994) the male identity is confirmed through what the man chooses to eat, whereas the female identity, to a larger extent, is defined by what she does not eat. Adams (1990) and Fiddes (1991) described red meat-eating as being symbols of power values that are associated with patriarchal and masculine values. Meat scepticism among younger women may, in a similar way, be an expression of female identity.

#### *4.3. Changes in consumption of red meat*

This study revealed that lower hedonic scores for beef among females were supported by their significantly lower interest in increasing their consumption of beef accompanied of the wish to reduce consumption of processed products of red meats. These results support the relationships between attitudes and attributes discussed previously, and are in accordance with Santos and Booth (1996) who found that chicken was the least often avoided flesh food.

#### *4.4. Limitations of the study*

Taking into account the limitation of using a convenience sample, we still consider the sample to be fairly representative for young consumers in Norway. The sample consisted mainly of secondary and high-school students from two central regions near the capital city, consisting of residents from both farming and city districts. The fact that almost all of the

teenagers in Norway attend high school minimises the risk of recruiting less educated young people. We still cannot rule out the possibility of recruiting consumers with strong feelings about meat to the study, but self-selection was considerably reduced through the location of the study stand and that everybody that was asked volunteered to participate.

## **5. Conclusions**

The sensory drivers of liking for meat among our respondents were related to low intensities in red colour (as redness confirms the blood content of meat) and red meat flavours/odours. The preference for white appearance, “neutral” odour and taste was slightly more correlated to females than males. Furthermore, these findings were strengthened and supported by females’ sceptical attitudes towards red meat and meat-eating. Negative attitudes and beliefs were specifically related to dissatisfaction with blood in meat and body feel after meat consumption. The expectation that red meat is linked to dislike and negative attitudes among young females was therefore supported.

The negative attitudes, desires and sensory preferences among young females may probably have a long-term negative effect on consumption of red meats in Norway for this segment, but this has to be investigated further. Consequently, moving away from home could result in young females adjusting their food habits towards more vegetables and white meats.

## **Acknowledgements**

We wish to thank referees, Per Lea, Margrethe Hersleth, and Ellen Tronrud for useful comments during the preparation of this paper. Thanks also to Tormod Næs for interesting methodological discussions. Laura Blümlein, Inger-Johanne Fjøsne and Aud Espedal are thanked for valuable practical assistance during the sensory and consumer test. The sensory panel is thanked for their important performance in the sensory test. Thanks to Tom Nitteberg for graphical assistance with figures. Finally, thanks to support from supervisor Inge Jan Henjesand at the Norwegian School of Management, BI.

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# The Effect of Animality in the Consumption Experience- A Potential for Disgust

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## Abstract

This paper presents an experimental study to measure the effect of *animality* on consumers' disgust. In this study we have demonstrated how the negative emotion of disgust may be formed within meat consumption. While in the current literature animality is used as a broad and vaguely defined explanatory concept, we conceptualise and operationalise three components of animality; Meat Typicality, Vividness and Personification. We show for each component that the more the meat stimuli can be animalised the more disgust they would provoke. Empirically, this study provides evidence for disgust with meat as being a phenomenon particularly concerning females and young consumers. The results also show a relatively good performance of personality measures as disgust sensitivity in the prediction of disgust with meat.

**Keywords:** Animality, symbolic, disgust, disgust sensitivity, age, gender, experimental

Acknowledgement: The authors would like to thank Professor Luk Warlop for reviewing earlier drafts of this manuscript.

## Introduction

Marketing success is largely determined to the extent that consumers are having a positive emotional consumption experience, and when unappealing attributes and cues that can motivate negative feelings are minimised. The potential *disgust attributes* associated with a product and the negative emotional reactions to it represent barriers to purchase and consumption. Evidently, the knowledge about how food products come to evoke disgust should be considered valuable information for the product developers and marketers. This knowledge would increase the chance of better to comply with critical tastes of consumers, and increase the appeal of foods in every stage of food-consumer interaction (in the shop, in market communications like advertising, in meal preparation and eating situations).

The focus of this study, disgust, represents an unstudied area within the marketing context. Although the study on emotion in the field of marketing has increased in popularity, in depth research on discrete emotions like food-related disgust is rather scant, the recent study by Shimp and Stuart (2004) being the only known exception. In their research they looked at advertising of food (meat in fast food advertising) and the role that disgust in response to food advertising plays in mediating the effect of advertising content on purchase intentions. They tested the hypothesis that the uncooked, raw meat included in advertising for a sandwich from a fast-food restaurant, would lead to unfavourable evaluations with respect to the restaurant (feelings of disgust with the food and negative intentions to visit and eat at the restaurant), a hypothesis that was confirmed both for beef and chicken.

The symbolism attached to meat and the taboos of meat eating have been documented in cultural studies (Adams, 1990; Douglas, 1996; Døving, 2003; Fiddes, 1991; Lupton, 1996; Simoons, 1994). Meat is the most valuable food in most cultures, but paradoxically, foods from animals are also the most likely to be associated with negative symbolism and taboo against consumption. Meats are often accompanied with strong negative feelings and are often a reoccurring theme in religious observance. In the psychological literature Angyal (1941) positioned animal products as the central focus for disgust, and Rozin and Fallon (1980) found that when consumers were asked to mention a disgusting food they often came up with a food from animal origin. Disgust as a primary and distinct emotion is motivated through “taking in or being close to an indigestible object or idea (Lazarus, 1991), and according to Rozin and Fallon (1987) the offensiveness or indigestibility is centred on *animality* as the starting point. The perspective on experiential consumption particularly recognises the importance of emotions in consumer product interaction and the significance

of symbolism (Hirschman & Holbrook, 1982; Holbrook & Hirschman, 1982).

The scope of this article is twofold. Our first aim is to conceptualise and operationalise three aspects of animality in a food context. Secondly, we wanted to manipulate these symbolic elicitors of disgust in an experimental setting and measure disgust responses at the prospect of eating as an effect of age, gender, and disgust sensitivity.

## **Theoretical Background**

Disgust is an important emotion in everyday life, and it is realised when consumers think of or experience unpleasant situations (Mela, 2000; Rozin & Fallon, 1987). According to Miller (1997) disgust is regarded as the purest aesthetic taste, because taste in the sense of “good taste” refers to our ability to refuse and be offended by things that are vulgar or inappropriate. Angyal (1941) interpreted disgust as a reaction to unwanted intimacy, focusing on bodily incorporation, with the mouth as the central focus. Tomkins (1963) further argued that the purpose of disgust is “to defend the self against psychic incorporation or any increase in intimacy with a repellent object”. Rozin and Fallon (1987) and Rozin, Haidt, McCauley, and Imada (1997) proposed a Theory of Disgust and defined disgust as “a food-related emotion which is characterised by a revulsion at the prospect of oral incorporation of an offensive and contaminating object”.

Disgust is at first motivated by ideational factors (symbolic associations) referring to the nature, the origin, and the history of the item. Disgusting items are furthermore considered inappropriate, have offensive features, and are presumed to taste badly (Rozin & Fallon, 1987).

### **Animality as Primary Elicitor of Disgust**

The primary basis for disgust is the ideational conception of animality (Rozin & Fallon, 1987). Among humans there is a widespread aversion to different animals as consumption products, though the focus of disgust may vary from culture to culture (Rozin, 1989). Angyal (1941) proposed that all disgusting items are animal products. According to Miller (1997) the disgust for animals is like a mirror: the animals that disgust us do not disgust us as animals, but because they have gestalt characteristics that are similar to our

own. Haidt, McCauley, and Rozin (1994) theorised that the emotion of disgust protects us against recognition of our own animality and maintains the line between humans and animals. Magical thinking wherein the consumer is thought to acquire the properties of the item consumed may serve as a symbolic explanation for avoidance of offensive foods from animal origin (“you are what you eat”) (Rozin & Fallon, 1987), thus the disgust function to avoid such interactions. We have conceptually defined animality as symbolic aspects that animals and humans at some level have in common. Even though the notion of general animality has been discussed with respect to taboos of animal food (e.g. Angyal, 1941; Fiddes, 1991; Guzman & Kjærnes, 1998; Leach, 1964; Rozin & Fallon 1987; Tambiah, 1969), animality as a construct has never been properly operationalised for empirical testing.

## Conceptual Development

### Three Aspects of Animality

We have named the first aspect of animality *Meat Typicality*, which refer to the extent the meat resembles the flesh. Earlier investigations related to the meaning of disgust with respect to various meat types suggest that disgust properties and sensory dislike seemed to be particularly attributed to red meat varieties and less to white meats such as chicken (Kubberød, Ueland, Rødbotten, Westad, & Risvik, 2002; Kubberød, Ueland, Tronstad, & Risvik, 2002). Some claim that the meat’s white appearance and lack of redness (symbolical link to blood) is less likely to be associated with the meat category and flesh (Gregory, 1997; Guzman & Kjærnes, 1998). This factor is therefore closely associated with the red colour in meat, which has shown to be a very powerful symbolic stimulus typical for meat (Adams, 1990; Elias, 1978). Indeed even those who eat red meat may be disgusted by exposure to redness in meat (Beardsworth & Keil 1992; Kenyon & Barker, 1998; Kubberød, Ueland, Tronstad et al., 2002).

The second aspect of animality is referring to the extent to which the meat resembles distinctive cuts removed from a carcass and is named *Vividness*. Most of the meat and meat products are cut and prepared in a non-recognisable form in order to disguise their animal nature (Angyal, 1941). Processing or cooking the meat before consumption removes its origins and makes the meat less linked to the animal. Gregory (1997) and Guzman and Kjærnes (1998) described this as the process of *deanimalisation*. In this

respect hamburgers and small product cuttings are examples of typical non-vivid types of meat that are very popular among respondents who display reluctance towards meat (Kubberød, Ueland, Tronstad et al., 2002). The opposite is true for entrails and distinctive meat cuts, which could be associated with animal body parts, and ultimately remind the respondents of the living animal and the slaughter of it (Elias, 1978; Kenyon & Barker, 1998; Kubberød, Ueland, Tronstad et al., 2002; Rozin & Fallon, 1987; Santos & Booth, 1996).

We developed the concept of *Personification* as the third aspect of animality. This aspect was conceptualised to be dealing with the emotional closeness to humans. The Norwegian anthropologist Runar Døving has worked with this type of relational classification taxonomy for edibility of animals in the Norwegian culture, according to the distance between humans and animals (Døving, 2003). Animals (as potential foods) that are rejected are typically those that can be emotionally close to humans (primates, pets) (Leach, 1964; Rozin & Fallon, 1987). As animals get closer to humankind, they become more disgusting as consumption objects, thus they become subjects that are more personified (Guzman & Kjærnes, 1998).

### **Adolescents, Females, and Meat Avoidance**

Although there are men that avoid meat it is predominantly a female phenomenon, especially among young females with a mean age around 16 (Gregory, 1997; Santos & Booth, 1996; Worsley & Skrzypiec, 1998; Wright & Howcroft, 1992). Mooney & Walbourn (2001) investigated rejection of food among young students in a survey. They found that among women, those who were meat avoiders reported greater dislike and disgust in response to meat in contrast to other avoided foods brought up in the study. Young females, reluctant to eat red meat find it emotionally disturbing due to the difficulty of separating the living animal from the meat on the dinner plate (Kubberød, Ueland, Tronstad et al., 2002; Worsley & Skrzypiec, 1998). Dislike and disgust for blood is also commonly mentioned as reasons for red meat avoidance (Gregory, 1997; Santos & Booth, 1996). These aspects differ from what older consumers report as major reasons for reducing meat consumption (Gregory, 1997; Worsley & Skrzypiec, 1997).

## **Individual Differences in Disgust Sensitivity and Meat Consumption**

Individual differences in response to product stimuli can underlie also other consumer traits (Bloch, Brunel, & Arnold, 2003). With reference to disgust, Haidt, McCauley, and Rozin (1994) developed the general Disgust Sensitivity Scale. Seven domains of elicitors representing animal, body products, sex, body envelope violations, death and hygiene were found to show positive interrelations. An individual who was more sensitive than the average to one domain of the scale tended to be more sensitive than the average in the other domains as well. The propensity to experience disgust is correlated among those domains and it therefore makes sense to conceptualise a general disgust sensitivity trait (Druschel & Sherman, 1999; Quigley, Sherman, & Sherman, 1997; Rozin, Haidt, & McCauley, 1999).

The authors are not aware of any other research addressing the relationship between disgust sensitivity and meat consumption, except for the recent study by Fessler, Arguello, Mekdara, and Macias (2003). They hypothesised that respondents exhibiting low disgust sensitivity would consume a lot of meat and lack negative attitudes about meat and vice versa. Surprisingly, the results revealed a small positive correlation between overall disgust sensitivity and reported meat consumption frequency. The only area in which disgust sensitivity shaped the dietary preferences was for blood in red meat. They found a positive correlation between disgust sensitivity and the preference for cooked red meat. We employ the approach in which sub groups are defined a priori before being compared on the basis of their emotional response. In our study we look at how the trait of disgust sensitivity is linked to negative emotional response to symbolic meat stimuli.

### **Hypotheses**

We hypothesise the following mechanisms related to the formation of disgust:

- H1) The more the meat stimulus is
  - a) associated with flesh (Meat Typicality)
  - b) associated with distinctive meat cuts from the carcass (Vividness)
  - c) emotional closer to humans (Personification) the more disgust it will provoke.

- H2) The effect of these animality elicitors on disgust response would be more pronounced in females, young consumers and people exhibiting high level of disgust sensitivity.

## Method

### Operationalisation and Measurement of Independent Variables

The experimental approach chosen for this study was a full factorial design (2<sup>3</sup>) with three disgust eliciting factors of two levels each (see Table 1). The underlying assumption for the design is that these symbolic properties of animality are experienced in a gestalt like manner (as distinctive wholes) and cannot be evaluated attribute by attribute (see Hirschman, 1983). The design resulted in eight possible experimental combinations presented for each subject in randomised order.

**Table 1. The Factorial, Experimental Design**

No	Meat Typicality		Vividness		Personification	
1	White (chicken fillet )	-	Picture of prepared meal	-	No name	-
2	Red (prime fillet of beef)	+	Picture of prepared meal	-	No name	-
3	White (chicken fillet)	-	Picture of cuts	+	No name	-
4	Red (prime fillet of beef)	+	Picture of cuts	+	No name	-
5	White (chicken fillet)	-	Picture of prepared meal	-	Pet name <sup>a</sup>	+
6	Red (prime fillet of beef)	+	Picture of prepared meal	-	Pet name <sup>b</sup>	+
7	White (chicken fillet)	-	Picture of cuts	+	Pet name <sup>a</sup>	+
8	Red (prime fillet of beef)	+	Picture of cuts	+	Pet name <sup>b</sup>	+

<sup>a</sup>Meat from the chicken Ludvig. <sup>b</sup>Meat from the calf Benjamin.

The operationalisation of the first design variable Meat Typicality took into account that some varieties in the meat category promote more disgust than others (because of its resemblance with flesh). The factorial levels of this design variable were operationalised as white meat (low association to Meat Typicality) and red meat (high association to Meat Typicality). A previous qualitative study has addressed the associations related to the term meat. The result was convincingly clear showing that white meat was considered a less typical meat than red meat (Kubberød, Ueland, Tronstad et al., 2002). Additionally, a pre-test was conducted to confirm the levels of this factor. Real meat stimuli of chicken and beef were presented to a sample of 8 consumers not participating in the main study. The procedure was as following: The subjects were asked to evaluate the perceived disgust for each meat. The result from this pre-test confirmed that the respondents perceived the red meat as more disgusting than white meat. The product



stimuli were purchased in a supermarket from a fresh food counter. The choice of meats used in this experiment were fillets from beef (+ level) and chicken (- level), see Table 1. In the main experiment the meat fillets of red and white meats were served on white plates, which correspond to sensory analysis guidelines of food assessment. This was done in order to provide a similar experimental context for all the “real” stimuli in the design.

The operationalisation of the second design variable Vividness was concerned with the meat’s form of presentation. The upper level was operationalised as recognisable, distinctive meat cuts from the carcass, which was thought to trigger the association between the meat and the living animal. The lower level was operationalised as small cuttings in prepared meals (deanimalised, non-vivid food), which was predicted to be less associated with the living animal. By the help of a professional photographer we designed pictures of distinctive, raw meat cuts versus prepared meals of red and white meats, respectively. The levels of this design variable were also confirmed in the pre-test. The result confirmed that the raw meat cuts were perceived more disgusting than the prepared meals, regardless of whether it was red or white meats in the pictures. The picture stimuli were made in A3 format for the main experiment and were physically placed behind each real meat stimulus. All the pictures were in colours and were typical pictures used from marketing campaigns for meats. The picture stimuli employed in the study are presented in Appendix in Figure A1.

Personification dealt with the degree of subjectivity of the food. Unlike the first two facets of animality, which dealt with the physical forms that humans and animals share, the third design variable was concerned with the emotional distance between the animal and the human. This design variable was operationalised by naming the meat presentation with pet-like names and type of animal (high level of personification and small emotional distance) or not naming them (low level of personification and larger emotional distance). This is in accordance with the results found in a previous qualitative study among consumers found in the Norwegian population (Kubberød, Ueland, Tronstad et al., 2002). The pre-test showed that by adding this type of information to the meat presentations the respondents perceived it as much more disgusting, and the naming was shown to be independent of whether it was white or red meat stimuli or more or less vivid. In the main experiment this personification variable was indicated with a text (according to Table 1) written below the picture presentation.

## **Operationalisation and Measurement of the Dependent Variable**

Three measures were employed in this study to evaluate the influence of the design variables on the consumers' emotional reactions. The measures were adopted from Rozin, Markwith, and Stoess (1997) and the original wording of the statements were as follows: "The thought of eating meat makes me nauseous". "I resist eating meat because eating meat is offensive, repulsive or disgusting", "Emotionally I just can't chew and swallow meat". These measures were further translated to Norwegian and modified to target the prospect of consumption of the meats presented. The measures were back-translated and pre-tested among students and staff at the research institute to ensure the intended meaning of the items. The items were expressed in the following way:

1. The thought of eating a meal from this meat makes me nauseous (Nausea)
2. I wouldn't eat a meal from this meat because it is disgusting and offensive (Offensiveness)
3. I couldn't manage to chew or swallow this meat for dinner (Oral discomfort)

In the questionnaire these items were measured on 7-point rating scales anchored with endpoints "disagree strongly" (1) and "agree strongly" (7). In addition to these feelings states, positive feeling states were also listed in the questionnaire ("I would like to eat a dinner from this meat", "This meat makes me think about a good meal"), but only the measures of disgust were of interest. This was done in order to minimise the influence on consumers' response.

## **Consumer Variables**

In this study we used items from the General Disgust Sensitivity Scale developed by Haidt et al. (1994). The original scale is composed of eight sub-scales (*food, animals, body products, sex, body envelope violations, death, hygiene/interpersonal and magical thinking*), with 32 items which primarily relate to imagined disgust within those eight domains that extends beyond just the food area. The scale encompasses items describing offensive and repellent body products, foods and situations that are thought to evoke feelings of disgust in the individual if faced by them. The items were translated to Norwegian, and the Swedish and German versions of the scale aided in the translation because of the close linguistic similarities between those languages and Norwegian (see link on The Disgust Scale Homepage

and Schienle, Walter, Stark, and Vaitl (2002)). Then the scale was back translated to ensure the same meaning of the items. The translated scale was tested with respect to understanding of the wording of the items. The sample of pre-test participants (20 students) was drawn from the same population as the participants in the main study. We excluded the sex domain in this study. The reason for this was purely ethical, because the minimum age for sexual activity in Norway is 16, and some of our participants in the main experiment were 15 years old. Before inclusion of the scale for statistical hypothesis testing the dimensionality of the scale was tested. The items were subjected to factor analysis and reliability testing. The factor structure from our consumer sample turned out to be a little different than the original structure found by Haidt et al. (1994). Some of the items did not perform well in our consumer sample because of low or ambiguous (loaded on several factors) items. These items were dropped from the scale before further analysis. We ended up with 15 items that loaded on four main factors. The first factor was comprised of items from different domains in the original Disgust Sensitivity Scale. This factor could be interpreted to refer to what consumers generally find as offensive substances from humans or animals and was named *offensive items from human/animal origin*. The second factor consisted of items related to death and was similar to the original sub-scale except for one item that originally should capture magical thinking; “It would bother me to sleep in a nice hotel room if I knew that a man had died of a heart attack in that room the night before”. In our factor analysis this item performed better in the death factor. The next two factors described body envelope violations (exposure of human flesh) and hygiene/interpersonal, respectively, and these items were belonging to the same domains as found in the original scale. The items from our factor analysis, their domains and reliabilities are presented in Table 2. In this study we employed an overall disgust score as well as separate scores for each of the four sub-scales. The rationale for inclusion of sub-scales is to check whether there will be differences in disgust response depending on more specific domains of disgust sensitivity as well.

In addition to the disgust sensitivity, gender and age was included as consumer variables in the subsequent statistical testing of the hypotheses.

**Table 2. The Disgust Sensitivity Items and Domains Selected for the Study**

Domain	Item	Reliability
Offensive items from animal/human origin	You see maggots on a piece of meat in an outdoor garbage pail <sup>a</sup> While you are walking through a tunnel under a railroad track, you smell urine <sup>a</sup> . You see a bowel movement left unflushed in a public toilet <sup>a</sup> You are about to drink a glass of milk when you smell that it is spoiled <sup>a</sup>	0.71
Death	It would bother me tremendously to touch a dead body <sup>b</sup> It would bother me to sleep in a nice hotel room if I knew that a man had died of a heart attack in that room the night before <sup>b</sup> Your friend's pet cat dies, and you have to pick up the dead body with your bare hands <sup>a</sup> You accidentally touch the ashes of a person who has been cremated <sup>a</sup>	0.68
Envelope violations	It would bother me to be in a science class, and to see a human hand preserved in a jar <sup>b</sup> You see someone accidentally stick a fishing hook through his finger <sup>a</sup> You see a man with his intestines exposed after an accident	0.60
Hygiene/Interpersonal	I try to avoid letting any part of my body touch the toilet seat in a public restroom, even when it appears clean <sup>b</sup> I would not hold a dollar bill between my lips (like if I needed a free hand), because so many strangers have touched it with their dirty hands <sup>b</sup> You take a sip of soda and then realise that you picked up the wrong can, which a stranger had been drinking out of <sup>a</sup> You sit down on a public bus, and feel that the seat is still warm from the last person who sat there <sup>a</sup>	0.60

<sup>a</sup>The item was rated on a 4-point scale with labelled points 1= Not disgusting at all, 2 = Slightly disgusting, 3 = Moderately disgusting, 4 = Very disgusting.

<sup>b</sup>The respondents rated the item on a 4-point disgust scale with anchored endpoints, “strongly disagree” and “strongly agree”.

## **Description of Consumers**

250 consumers were recruited from different sources: high school, teams and clubs in the south-eastern part of Norway. The different school classes, associations and clubs were paid collectively for their participation in the study. After discarding cases with missing variables, 236 consumer cases remained for analysis, none of whom were professionally involved or had close family ties with professionals in the meat production or processing industries.

The sample consisted of 119 adolescents and 117 adult consumers. There were 118 females and 118 males in the sample. The young group of consumers consisted of high school students from age 15 to 18. They were recruited from five different classes at a high school. The second age group consisted of adult consumers who ranged from 21 to 69 years in age. The region the participants were selected from is considered a typical meat eating area (Lien, Bjørkum, & Bye, 1998). This was done in order to ensure that any disgust effect from meat should not be due to low availability of meat in the diet.

## **Procedure**

The participants were told that the test included only responding to product presentations without any tasting of samples. The experiments took place on two consecutive days and were divided into two sessions. In the first session the experiment was conducted. In the second session we measured consumer characteristics.

Each of the 8 experimental conditions comprising the design (see Table 1) was separated from the other in a big hall. The stimuli were displayed on different tables.

The stimuli had corresponding codes that were randomised differently for all the respondents in the first questionnaire. The experimental conditions were to overcome ordering effects in the data. The respondents were not allowed to talk to each other during their walk from presentation to presentation and were instructed not to stand on the same presentation together. For this reason there were only 10 respondents in the room at all times.

After completing the first session the respondents were led to another room and were again instructed to fill in one last questionnaire with general questions. Due to the nature of the questions in the disgust sensitivity scale

the instructor warned that some of the questions may seem rather odd, but still it was important that the respondents indicated their immediate reactions to them.

### **Statistical Analyses**

The Cronbach Alpha was calculated for the disgust measures in SPSS (version 11.5), in order to ensure the reliability of the dependent variable before further analyses. The dependent variable was calculated by taking the average of the three items for each experimental condition. The reliability (Cronbach Alpha) of the dependent measures comprising the dependent variable ranged from 0.71 to 0.91, and using the composite mean values as disgust responses were considered adequate for further analyses. From now on, these average values will be referred to as disgust responses.

The disgust responses were subjected to traditional *t*-test and ANOVA estimation in SAS (version 8.2), with reference to the treatment combinations in Table 1.

First we calculated the effects from the design variables on the disgust responses for each consumer. With reference to Table 1, the effect of one design variable was calculated as the mean of the four response values on the higher level minus mean of the four responses on the lower level (what happens to the disgust response when we go from low to high level in the design variables). Secondly, the means of these effects were tested by an ordinary *t*-test to test the first hypothesis. Thirdly, we ran three straightforward independent models for each design variable (3 ANOVAs all together) to test the second hypothesis. The ANOVA models involved the effects of gender (two levels), age group (two levels), general disgust sensitivity (two levels), four sub-scales of disgust sensitivity (two levels each) and the three design variables (two levels each). This procedure is equivalent to running a large mixed model with three within and seven between subjects factors.

## RESULTS

Generally, by looking upon the consumers as one single group, the disgust responses were not particularly high. The mean disgust responses for the lower levels of animality were 1.51 (Meat Typicality), 1.54 (Vividness), and 1.57 (Personification), respectively. The mean disgust responses for the higher levels of animality were 1.73 (Meat Typicality), 1.70 (Vividness) and 1.67 (Personification), respectively. The effect of going from low to high level in the design variables was largest for Meat Typicality, then Vividness and Personification. The low absolute values indicate that many consumers in the sample were not disgusted by the stimuli from the design.

Table 3 contains the mean disgust effect of the design variables. All three design variables significantly influenced the disgust response across all consumers ( $p < 0.001$  for Meat Typicality, Vividness, and  $p < 0.05$  for Personification). The first general hypothesis suggesting the more the meat can be animalised, the more disgust it would provoke was confirmed. Table 3 also reports results obtained from ANOVA for each of the design variables as the effects of the consumer variables. The effect of meat typicality depended significantly on age and gender ( $p < 0.001$ ). If we study the table of average disgust effects (Table 4) we see that the disgust effects for red meat was higher in young consumers in contrast to adults. This effect is also apparent for females in contrast to males. Furthermore, general disgust sensitivity was almost significant at 5% level, as well as the sensitivity to the sub-domains: envelope violations and death ( $p < 0.05$ ). This means that the respondents scoring high on those scales were more influenced by this factor than people scoring low on the respective scales (see Table 4). We can therefore conclude that the second hypothesis with respect to Meat Typicality was confirmed for all of the main consumer variables, and for some of the sub-scales of disgust sensitivity.

The effect of vividness on disgust response depended significantly on gender and general disgust sensitivity, though only at the 10% level. Table 4 confirms that going from low to high levels of disgust sensitivity and from males to females, the disgust effects increase. The effect of vividness also appeared significant for death sensitive consumers ( $p < 0.05$ ). The interaction age x gender was significant at the 10% level. Thus hypothesis number two only got partly confirmation with regard to the consumer segmenting variables and this factor.

The effect of personification depended significantly on gender ( $p < 0.001$ ) and on age ( $p < 0.10$ ) (see Table 3 and 4). Thus the second hypothesis with respect to Personification was only supported for those consumer variables and none of the disgust sensitivity scales showed significant influence.

**Table 3. Summary of Tests for the Effects of the Design Variables (n=236).**

Source	df	Meat Typicality		Vividness		Personification	
		SS	F	SS	F	SS	F
Mean disgust effect	1	12.09	12.45***	5.93	21.84***	2.32	4.32*
Age	1	16.97	21.37***	0.02	0.10	1.73	3.40†
Gender	1	19.16	24.12***	0.94	3.61†	5.67	11.12***
General disgust sensitivity	1	2.97	3.74(*) <sup>a</sup>	0.97	3.72†	1.18	2.31
Offensive items sensitivity	1	0.08	0.11	0.31	1.17	0.00	0.00
Envelope violations sensitivity	1	3.90	4.91*	0.06	0.23	0.19	0.38
Hygiene/interpersonal sensitivity	1	0.91	1.15	0.46	1.77	0.52	1.01
Death sensitivity	1	3.01	3.79(*) <sup>b</sup>	1.54	5.89*	0.85	1.66
error	228	181.17		59.52		116.30	

Note. SS = sum of squares. The interaction effect age x gender for Vividness was significant at the 10% level.

†  $p < .10$ . \*  $p < .05$ . \*\*\*  $p < .001$ .

(\*)<sup>a</sup>  $p = 0.054$

(\*)<sup>b</sup>  $p = 0.053$

**Table 4. Average Disgust Effects in Consumer Segments**

	Meat Typicality	Vividness	Personification
Adult	-0.04 (0.63)	0.15 (0.43)	0.01 (0.65)
Young	0.49 (1.18)	0.17 (0.60)	0.18 (0.79)
Male	-0.05 (0.66)	0.09 (0.48)	-0.06 (0.37)
Female	0.51 (1.16)	0.22 (0.56)	0.25 (0.94)
Low general disgust sensitivity	0.10 (0.70)	0.09 (0.43)	0.02 (0.63)
High general disgust sensitivity	0.33 (1.16)	0.22 (0.58)	0.16 (0.81)
Low sensitivity offensive items	0.19 (0.90)	0.10 (0.56)	0.09 (0.66)
High sensitivity offensive items	0.24 (1.02)	1.18 (0.50)	0.10 (0.77)
Low sensitivity envelope violations	0.05 (0.76)	0.14 (0.46)	0.06 (0.66)
High sensitivity envelope violations	0.31 (1.07)	0.17 (0.55)	0.12 (0.77)
Low sensitivity hygiene/interpersonal	0.17 (0.91)	0.12 (0.43)	0.14 (0.83)
High sensitivity hygiene/interpersonal	0.30 (1.06)	0.21 (0.62)	0.05 (0.58)
Low sensitivity death	0.11 (0.70)	0.08 (0.36)	0.04 (0.60)
High sensitivity death	0.34 (1.20)	0.24 (0.64)	0.16 (0.84)

Note. The values in parentheses represent standard deviations



## Discussion and Implications

This study has expanded on the understanding of how a negative emotion may be formed with meat. The theory on animality and the literature accounting for this as a primary driver of disgust may be regarded as a rather broad theoretical explanation. In this study we have made an attempt to conceptualise this rather complex phenomenon, operationalised it and tested three facets of this concept on disgust response. This study therefore contributes to the theory on disgust by providing a deeper understanding of symbolic elicitors of disgust in the animal food context.

But why address such an unpleasant topic as disgust and why does it matter? In the quest to understand why people consume how they do, it is equally important to discover what they do not eat and why they don't like it. The dislike or disgust associated with particular foods reflects the cultural environment in which the consumers are participants (Mela, 2000; Rozin, 1989). One might expect that the threshold for disgust with animal derived food will probably be lower as the society becomes more urbanised, and when fewer and fewer people acquire first hand experience with animals and animal handling (Shimp and Stuart, 2004).

Empirically, this study provides evidence for disgust with meat as being primarily a phenomenon strongest among females, a finding that corresponds with our earlier findings and literature studies. Generally, we demonstrated that red meat as a symbolic marker of animality and flesh (Meat Typicality) evoked more disgust in the consumers, as well as other features such as distinctive animal cuts from the carcass (Vividness). We have also shown that the emotional distance between human and animal (Personification) was a critical disgust elicitor, hence the smaller the distance between animal food and the consumer, the more disgust it provoked. Overall, these results point at consumers preferring their food from animal origin to be conceptually distanced from the animal and the person consuming it.

From our manipulations, we found that the meat stimulus' symbolic association to flesh was an important elicitor of disgust with meat. This effect was strongest among young consumers, females, disgust sensitive consumers in general, and among consumers scoring high on envelope violations and death. We found a relative good performance of disgust sensitivity measurements in relation to this factor, as also found by Fessler et al. (2003). The close association between envelope violation sensitivity and death sensitivity to Meat Typicality is confirming the content validity of this

factor. First, envelope violations and Meat Typicality may be closely related in terms of their similarities in being concerned with exposure of flesh, and the more typical the flesh the more it can remind us of our own gestalt animal characteristics (Miller, 1997). Second, blood is considered one of the strongest symbolic animality factors, and the appearance of red meat due to its blood content may be associated with slaughter and death (Elias, 1978), and hence this factor's close association with death sensitivity.

Disgust sensitivity was significant for Vividness (though only at the 10% level), meaning that there is a tendency for consumers scoring high on disgust sensitivity to be more disgusted by the effect of displaying the food in a more vivid form (animal carcass rather than meat cuttings in a meal). More specifically, death sensitivity was significant for Vividness (at the 5% level). This result is intuitively easy to interpret. The content of Vividness has to do with the distance between meat as food and cuts removed from the carcass that may be associated back to the dead animal. The significance of death sensitivity to Vividness can be considered as support for a valid operationalisation of this factor. Furthermore, the effect of vividness was significant only at the 10% level for females, and it did not influence the younger consumers per se. However, the interaction of age and gender was significant at the 10% level, meaning that there was a slight tendency for young female consumers to be more disgusted by the effect of displaying the food in a more vivid form.

The result from this experiment showed that Personification, in terms of a closer emotional distance between the animal and the person, also seemed to provoke disgust. However, this factor was not as strong disgust elicitor as the other factors on a general level, but was particularly relevant for females and to a less degree younger consumer. Hence, the thought of eating a "fellow or friend" may be experienced as repulsive and becomes somehow taboo (Twigg, 1983), and in worst case regarded as cannibalism (Guzman & Kjærnes, 1998). Even though personification of the food was considered disgusting in general, this aspect was not related to the trait of disgust sensitivity. This dimension in the theory of animality is dealing with the ability of an animal to be a subject rather than an animal, but the Disgust Sensitivity Scale is directed towards concrete actions and objects of offensive nature in general. Thus, the domains in the prevailing scale are not covering this aspect in particular, except maybe for one item: "I might be willing to try monkey meat under some circumstances" (Haidt et al., 1994).

Hopefully, this study has several managerial implications. First, the meat industry needs to include and acknowledge the negative aspects of meat consumption in order to comply with consumer tastes in critical segments.

Our findings provide the marketers and product developers with an understanding of the consumer segments that may be more disgust sensitive to animal food products. Identity and behaviour sentiments towards foods formed during adolescence may later affect the future families' food behaviour. The segments of young females may therefore represent a critical and social barometer for future meat consumption.

Secondly, managers in the meat industry should have a careful look at critical tangible product attributes and how they can influence the appeal of their products. Generally, the disgust associated with animal stimuli should encourage product developers to present meat products that are less 'meat-like' in appearance. Introducing even more modern varieties of new products with high levels of processing, new packaging, marinated product that mask red colour and other animality aspects, and ready to cook and eat solutions may prevent consumers from negative consumption experiences. This research not only has implications for physical, tangible product attributes and their presentation, but also for the nature of the marketing communication content of meat products. Employing pictures of distinctive, raw animal cuts in market communication of meat may appear very unappealing to some "sensitive" consumers, and work in an unintended way. This is parallel to the recent findings of Shimp and Stuart (2004). They claimed that although the intent of food advertisers is to present meat as natural, fresh and appealing products, the effect of such appeals "may backfire by triggering disgust and offending rather than motivating the consumers". Furthermore, labelling associated with the product impart information that the consumers evaluate to make their brand choices. If producers brand their meat products with human like names and provide detailed information of the life of the animal, they may not realise that consumers may generally have a much deeper and more complex understanding of the brands (Domzal & Kernan, 1992). This research suggests that such a strategy in for example origin marking may not be the right track for future marketing of meat products, since such branding may carry unintended effects. Overall, the meat industry will hopefully benefit from a routinely investigation of the meaning of their marketing efforts with respect to market communication of meat products.

## Limitations and Future Research

This research aimed to operationalise and test disgust eliciting symbolic stimuli in relation to meat consumption. However, we acknowledge that other factors and levels of operationalisations may coexist along with those conceptualisations proposed in this paper. Furthermore, the small effects found reflect the fact that the stimuli were manipulated at relatively low absolute levels compared to “real life” disgust elicitors. Obviously, to conduct research that may violate the consumers’ well-being was neither the intent nor the interest for this study. It can therefore be worth noticing that even though the independent variables were constrained and the effects in the study were small, the manipulations worked as expected.

Our experiment indicates that disgust sensitivity is a highly relevant trait in studies of resentment with food of animal nature. However, we did not use the Disgust Sensitivity Scale in its original form as developed by Haidt et al. (1994). This was mainly due to the fact that the focus for disgust is largely culture dependent (Rozin, 1989). Therefore, a scale developed for the American population may not show equally performance in terms of its dimensionality in a Norwegian population. Taking into the consideration that we only applied a subset of the original items from the scale in our analysis this still can confirm the relevance in using such an emotion trait in relation to disgust with foods. As an area for future research we encourage for further investigations of the Disgust Sensitivity Scale in other cultures, as well as a more specific exploration of additional sub-domains of the scale, one such being the dimension focusing on the emotional distance between human and animal.

According to Rozin and Fallon (1987), disgusting items are undesirable at any stage of interaction where there is a potential for ingestion. This can especially refer to situations as preparation. For future research and for the purpose of generalisation this design should be tested in the preparation context as well, given the fact that consumers may feel strong displeasure about preparing and touching raw meat (Kubberød, Ueland, Tronstad et al., 2002; Santos & Booth, 1996). Also research in more “real-life” settings would be advantageous for the purpose of generalisation.

Given the complex nature of the feeling of disgust and the measurement of it, this study has illustrated that disgust is a highly relevant phenomenon with regard to foods from animal origin. Generally, we also hope that this study can inspire other researchers to explore this area of emotional research within the marketing context.

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## APPENDIX

Picture stimuli used in the experimental design. Figure A1 displays the pictures for Vividness for the respective meats in the design, with the lower level operationalised as prepared meals and upper level operationalised as meat cuts.



*Figure A1. Picture Stimuli Used in the Experimental Design for Vividness*



## **Contents Part 3: Synthesis**

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## Overall discussion of empirical findings

Food consumption is a personal and emotional activity, and this thesis has demonstrated that meat can be evaluated emotionally on the basis of physical, tangible attributes, as well as on the basis of symbolic meanings. The papers in this dissertation have attempted to explore, conceptualise, and operationalise various antecedents of food-related disgust and measure their influence on emotional response. More specifically, the studies presented in this dissertation have addressed the following aims:

1. *To achieve a better contextual understanding of the motivation for the likes, dislikes, and disgust reactions related to different varieties of meats in the younger generation of consumers in Norway.*
2. *To operationalise and measure the effect of cognitive appraisals (ideational, sensory affective, anticipated consequences) and negative body esteem on red meat consumption as mediated by disgust with meat among young females.*
3. *To operationalise and measure the effect of sensory attributes in meat stimuli on sensory dislike as an effect of gender and to establish the link between meat attributes and meat attitudes.*
4. *To conceptualise and operationalise three aspects of animality. Furthermore, to manipulate these symbolic elicitors of disgust in an experimental setting and measure disgust responses at the prospect of eating as an effect of age, gender, and disgust sensitivity.*

The following discussion of the findings in the dissertation will be centred on the propositions outlined in the introduction part.

1. ***Food stimuli of animal origin elicit symbolic and subjective associations that exist beyond the significant product characteristics.***

The first proposition referred to the subjective conceptualisations of animal food stimuli, and in study 1 these were investigated for the term “meat” as understood in the younger generation of consumers in Norway. The meanings associated beyond the intrinsic product attributes, were in particular, unhealthiness and “heavy food”, a finding that corresponds well with the latest studies on meat’s status in the western, industrialised world. Furthermore, thoughts related to animal features (bloody, fatty, slimy); personified animals (like horse, lamb, pork); body parts of the animal such as organs/entrails; and “the living animal” easily came to the consumers’ minds when they reflected upon the term “meat”. In Rozin’s terminology

these were all related to the ideational conception of animality, which can be explained as to be dealing with symbolic aspects (sign characteristics) that humans and animals at some level have in common.

***2. Food stimuli of animal origin embody symbolic, sign aspects that at some level are disgust provoking.***

The second proposition dealing with the symbolic aspects in animal derived foods was addressed in study 4. In this paper high and low levels of animality were manipulated with the intention to provoke and measure disgust. Relevant factors related to animality were conceptualised and operationalised for empirical testing and were shown to influence disgust positively. We demonstrated that red meat as a symbolic marker of animality and flesh (Meat Typicality) evoked more disgust in the consumers, as did distinctive animal cuts removed from carcass (Vividness). We have also shown that the emotional distance between human and animal (Personification) was a critical disgust elicitor; hence the smaller the distance between animal food and the consumer, the more disgust it provoked. Overall, these results suggest that consumers preferred their food of animal origin to be conceptually distanced from the animal and the person consuming it. These manipulations provide managers in the meat industries with direct input for decision making, particularly with respect to presentation and communication of their products.

***3. Food stimuli of animal origin having distinctive or notable sensory characteristics are more disgust provoking compared to animal stimuli with less pronounced sensory properties.***

With respect to this proposition, paper 1 and paper 3 addressed the role of sensory attributes of meat stimuli in the contribution to disgust. In study 1 we wanted to explore the disgust associations related to meat properties on a deeper level, therefore a qualitative methodology was chosen. In this study it was revealed that disgust provoking attributes only seemed to apply to red meat varieties and not to the white. The informants tended to attribute more negative terms to red meats, in contrast to chicken. Based on reported experiences (paper1) sensory drivers of disgust were identified; such as appearance of blood and tough texture (see table 3.1). In study 3 we operationalised sensory meat attributes in terms of descriptors defined and evaluated by an objective sensory panel. The consumers preferred the white meat and white meat attributes (chicken) to the red meats and red meat attributes. The sensory attributes (as actually perceived through tasting) that caused more dislike were stronger intensities of colour, and odour, as well as

more distinctive and specific attributes as liver flavours and odours, off-flavour, gamy flavour/odour, and coarse texture. In the sensory meat map these attributes were most related to the reddest meat varieties, ostrich and beef, and least to chicken which was characterised by less distinctive attributes and milder and more neutral intensities in odours and flavours. We found that texture was less relevant in explaining the hedonic ratings in this study, but this result could be due to the fact that the samples for tasting were perhaps too small to get an overall impression of the texture in the meat samples. In sensory studies it is common not to allow the consumers to engage in too much analytical processing, as we in sensory research are primarily interested in their emotional and intuitive response to food products (Lawless and Heymann, 1998). As the preference mapping approach chosen for this study employs the objective panel data space as the reference, the underlying assumption is that the consumers would have the same perceptions of the meats as the panel members.

***4. Ideational concerns, sensory affective concerns and concerns related to negative consequence from eating are central in the appraisal of unappealingness of food stimuli of animal origin and can motivate disgust.***

Proposition 4, addressing the central components in the appraisal of disgust, were investigated qualitatively in study 1 and measured in studies 2 and 3. The sensory nature of meat is a salient factor in the disgust response. The action of seeing, taking into the mouth, chewing, digesting etc are all private experiences that can evoke disgust. Additionally, the ideational thoughts around meat consumption can motivate disgust. In the first study we found that many unappealing experiences with meat were related to such sensory and bodily concerns, as well as to moral and other aspects of animal production. Next, these factors were operationalised and measured in the subsequent quantitative studies. In study 2 these factors were shown to positively influence the disgust mediator in the prediction of red meat consumption. More specifically, these concerns were related to moral concerns for animals, texture in meat, bloodiness/red colour in meat, and satiety. In study 3 many of these concerns (“anti-red meat” attitudinal statements related to texture, bloodiness, and satiety) were significantly linked to decreased liking of red meat attributes. In the marketing literature anti-consumption attitudes attached to consumption products have gained little attention (Englis and Solomon, 1997). The marketers need to be aware of these concerns, because they represent barriers to consumption of their products.

**5. *Disgust with food stimuli of animal origin is expected to lead to avoidance behaviour.***

Proposition 5 was dealing with the relationship between disgust with food stimuli of animal origin and its predictive capability of behaviour. In paper 2 this proposition was addressed. We hypothesised that general disgust with meat would particularly lead to lower consumption frequency of red meat varieties, a hypothesis that was confirmed. The study has demonstrated that disgust is a relevant variable in the explanation of avoidance behaviour.

**6. *Consumers' disgust with food stimuli of animal origin appears to be closely related to individual characteristics such as experience, gender, age, and personality.***

Proposition 6, dealing with individual characteristics and disgust, has been addressed throughout the papers. From the first study, we found that the young respondents drawn from the Norwegian population represent consumers with little experience regarding the most common meats for consumption found in the Norwegian food stores of today. They hold little knowledge about where these meats come from, and in fact many of them do not want to know too much about the origin of the meats. Furthermore, they do not particularly trust the animal industry in handling the animals well. However, subjects with regular contact with farm animals displayed more relaxed attitudes towards animal production and reported no disgust reactions. This may be a finding worth noticing, as the society becomes more urbanised and fewer and fewer people grow up close to animal production. Furthermore, we found that males and females associated quite differently with respect to meats and meat eating. All the females tended to characterise meat and meat-eating experiences negatively. The intriguing finding that negative associations among females seemed to be related to disgust, whereas among males they were more related to distaste, is not reported elsewhere in the literature. Females also tended to associate meat with “heavy” food that had negative impact on their bodies. They were also less content with their body appearance and dieted more than males. In other literature sources aversion to meat has been shown to be more prevalent among consumers exhibiting negative body esteem and dieting behaviours (see introduction). In study 2 we modelled disgust as a mediator of red meat consumption in a sample of young female consumers and hypothesised the relevance of negative body esteem in its influence on disgust with meat. Although a small effect, we found that negative body esteem caused disgust with meat. Recently, Harvey et al. (2002) found that ratings of disgust were

higher among women with abnormal eating attitudes. In the third study we took a closer look at the gender difference in a consumer taste test. We tested the gender specific preferences and attitudes underlying consumption of meats, hypothesising a stronger sensory dislike of red meats among women. Females displayed, in contrast to males, significantly lower mean hedonic scores for the reddest meat varieties, i.e., ostrich, lamb and beef. Among females, it was found that the mean hedonic ratings of meat decreased progressively as the meat increased in red colour intensity and typical meat flavours. We found significant gender difference with respect to attitudes towards sensory aspects and satiety related to meat eating. Compared to females, males displayed higher attitudinal support for “pro-red meat” statements. Females were significantly more negative in relation to blood in meat and to body feel after consumption of red meat. Although white meats were preferred by both genders, the preference for white appearance, neutral odours and taste was more apparent for females. Thus, the hypothesis that the sensory attributes of red meat were linked to dislike among females was confirmed.

In study 4 we tested the effect of animality on disgust with meat at the prospect of eating meat, as an effect of age, gender, disgust sensitivity (the emotion trait of disgust) and sub-domains of disgust sensitivity. We hypothesised that the effect of Meat Typicality, Vividness, and Personification would be more pronounced in females, young consumers, and people exhibiting high levels of disgust sensitivity. Gender was again the most important individual variable, followed by age. More specifically, the effect of meat typicality was significant for young consumers and females. The effect of vividness was significant only at the 10% level for females. Furthermore, it did not influence the younger consumers. The interaction of age and gender was significant at the 10% level for this factor, meaning that young female consumers were more influenced by the effect of displaying the food in a more vivid form (animal carcass rather than meat cuttings in a meal). The effect of personification was significant for females and young consumers (the latter at the 10% level).

Disgust sensitivity was significant (almost at the 5% level) for Meat Typicality, meaning consumers scoring high on the disgust scale were more prone to be disgusted by meat that could be associated with the “flesh”. Secondly, though only at the 10% level, disgust sensitivity was significant for Vividness, meaning that there is a tendency for consumers scoring high on disgust sensitivity to be more disgusted by this effect. Death sensitivity was significant for both Meat Typicality and Vividness, and envelope violation sensitivity showed to be significant also for Meat Typicality (at the

5% level). First, envelope violations and Meat Typicality may be closely related in terms of their similarities in being concerned with general exposure of flesh, and the more typical the flesh the more it can remind us of our own body and gestalt animal characteristics (Miller, 1997). Second, blood is considered one of the strongest symbolic animality factors. The appearance of red meat due to its blood content may be associated with slaughter and death (Elias, 1978), hence this factor's close association with death sensitivity. Moreover, death sensitivity was significant for Vividness (at the 5% level). This result is intuitively easy to interpret, in that the content of Vividness has to do with the distance between meat as food and cuts removed from the carcass that also may be associated back to the dead animal. Contrary to what we hypothesised, disgust sensitivity was not found significant for Personification, which can be due to the fact that the scale is not covering the conceptual domain of emotional closeness between animals and humans. The particular findings from paper 4 provide the marketers and product developers with an understanding of the most "sensitive" consumer segments with respect to animality in meat products.

Overall, the findings in the doctoral project are closely associated with the cultural expectations around food consumption in general and meat consumption in particular. The findings from this dissertation confirm the cultural literature in the field, suggesting that males and females seem to exhibit different food preferences (Fürst, 1994; Lupton, 1996; Wesslén, 2000) and that red meat avoidance and scepticism is a typical female phenomenon. The privateness of food and eating is strong in the society and is an expression of bodily identity of the consumer. For example, for young women in the process of establishing a feminine identity, strong sentiments towards foods such as red meat can develop (Gregory, 1997; Martins, Pliner, and O'Connor, 1999; Mooney and Walbourn, 2001; Worsley and Skrzypiec, 1997). Food consumption may therefore represent one of the most obvious arenas for building identity in the modern society.

The empirical findings of the papers in this dissertation are summarised in Table 3.1.

Table 3.1 Summary of empirical findings from the dissertation

Aspect of study/Main determinants	Dependent variables	Main Findings
<p><b>Paper 1</b></p> <ul style="list-style-type: none"> <li>Meat stimuli</li> <li>Sensory attributes related to disgust</li> <li>Symbolic attributes related to disgust</li> <li>Gender</li> <li>Experience</li> <li>Negative attitudes/concerns</li> </ul> <p>Among males and females (aged 16 to 17 years)</p>		<p>Sensory disgust provoking attributes:</p> <ul style="list-style-type: none"> <li>Appearance of blood/red colour, fat</li> <li>Fibrous and tough texture</li> <li>Mouth feel (fattiness)</li> </ul> <p>Symbolic disgust provoking attributes:</p> <ul style="list-style-type: none"> <li>Living animal/personified animal</li> <li>Blood, slimy, fatty</li> <li>Body part/Organ</li> </ul> <p>Negative associations among females were based on disgust, whereas among males based on dislike</p>
<p><b>Paper 2</b></p> <p>Ideational concerns:</p> <ul style="list-style-type: none"> <li>Moral</li> <li>Blood</li> </ul> <p>Sensory affective concerns:</p> <ul style="list-style-type: none"> <li>Blood</li> <li>Meat texture</li> </ul> <p>Concerns related to anticipated consequences:</p> <ul style="list-style-type: none"> <li>Satiety</li> </ul> <p>Consumer characteristic:</p> <ul style="list-style-type: none"> <li>Negative body esteem</li> </ul> <p>Among females aged 15-18 years</p>	<p><i>Disgust with meat as recalled</i></p> <p>Disgust components:</p> <ul style="list-style-type: none"> <li>Offensiveness</li> <li>Oral discomfort/nausea</li> <li>Bad taste</li> </ul> <p><i>Red meat consumption</i></p>	<p>The proposed model was empirically justified</p> <p>All the determinants predicted disgust</p> <p>Disgust with meat predicted consumption of red meats negatively</p>
<p><b>Paper 3</b></p> <p>Sensory attributes of meats as operationalised by a sensory panel</p> <p>Negative attitudes towards meat (sensory and satiety concerns)</p> <p>Consumer characteristic:</p> <p>Gender</p> <p>Among consumers aged 14 to 29 years</p>	<p><i>Perceived dislike</i></p>	<p>Overall, attributes related to stronger flavours/odours, red colour, and distinctive flavours and odours as liver and gamy, as well as coarser texture (red meats) were more disliked</p> <p>The hypothesis that red meat and red meat sensory attributes were linked to dislike and negative attitudes towards meat eating among females was supported</p>
<p><b>Paper 4</b></p> <p>Symbolic “animality” attributes:</p> <ul style="list-style-type: none"> <li>Meat Typicality</li> <li>Vividness</li> <li>Personification</li> </ul> <p>Consumer characteristics:</p> <ul style="list-style-type: none"> <li>Gender</li> <li>Age</li> <li>General disgust sensitivity, and domains of disgust sensitivity</li> </ul> <p>Among consumers aged 15 to 69 years</p>	<p><i>Perceived disgust</i></p> <p>Disgust components:</p> <ul style="list-style-type: none"> <li>Nausea</li> <li>Offensiveness</li> <li>Oral discomfort</li> </ul>	<p>The more the meat could be animalised, the more disgust provoked</p> <p>The effect of Meat Typicality depended significantly on gender, age, general disgust sensitivity, envelope violation sensitivity, and death sensitivity</p> <p>The effect of Vividness depended significantly on death sensitivity,(gender), (general disgust sensitivity), and (gender x age)</p> <p>The effect of Personification depended significantly on gender and (age)</p>

Note. The sources in parentheses in the right column for paper 4 denote significant at the 10% level.



## **Contribution of the studies**

This dissertation has addressed the experiential aspects of meat consumption and demonstrated the relevance of one particular negative product emotion within food consumption.

First of all, in the marketing literature, there has been a lack of studies focusing on emotions generated by specific consumption objects like foods, as well as lack of an in depth analysis of single emotions like disgust. This dissertation therefore expands the traditional focus on emotions in the literature and should make a contribution to the consumer behaviour literature in general, and to food consumption in particular.

In this thesis we have focused on the relationship between consumer and product characteristics in the influence on disgust with animal food stimuli. Initially, we have applied a traditional theoretical framework and tested some of its aspects in four papers; and hopefully we have contributed to a better understanding of emotional responses to foods in the consumer behaviour literature. We have framed our studies within this theoretical framework to attack the theme of emotional response from different perspectives. By this approach we have devoted considerable attention to the understanding of the sensory and symbolic eliciting properties, the personal concerns, individual differences in emotional responses, as well as to facets of the emotional response itself. Even though the dissertation is limited to disgust with meat, the concepts that are discussed and addressed in the papers are thought to be relevant to other aspects of food consumption, and it is thought that the framework can be applied to other food products of animal origin.

The qualitative paper has contributed to the overall theoretical model to elicit the attributes of importance involved in the consumer evaluation process of disgust, as well as to an understanding of the personal influences on disgust. Overall, this study thus provided the contextual understanding of the consumer response system to a food product category.

We have operationalised specific concerns and contributed to an understanding of these in the cognitive appraisals of disgust and their influence on disgust and subsequent consumption behaviour. We have demonstrated disgust with meat as a relevant mediator in the prediction of red meat consumption and shown that this variable actually carried important influence from the independent variables.

The studies in the dissertation have concentrated on the use of senses, direct experience, and actual stimuli to assess consumers' emotional responses to food products (papers 3 and 4). We have also found that the emotional responses to food products are highly related to the cognitions derived from previous learning with the stimuli (paper 2). In that way, the quantitative studies demonstrate the value of acknowledging both the cognitive and sensory-affective dimensions of the consumer response system to products.

The latter two papers in the dissertation have also demonstrated that significate (sensory) and sign (symbolic) attributes are both relevant to explain emotional responses to foods. The special focus on the basis for the evaluation process and the link to the consumer response system offers direct implications for managerial manipulations. Furthermore, in the current literature animality is used as a broad and vaguely defined explanatory concept, but we have tried to conceptualise and operationalise three components of animality: *Meat Typicality*, *Vividness* and *Personification*. We demonstrated for each component that the more the meat stimuli could be animalised the more disgust they provoked. Hopefully, these components represent a theoretical contribution to the disgust theory itself.

With respect to individual differences in emotional response, we have found that more internal characteristics related to personality and experience and that demographics such as age and gender are key to understanding the differences in disgust with animal derived foods; and the selection of the relevant variables are prerequisite before studying emotional responses of consumers. The finding that among females negative associations were based on disgust, in contrast to the distaste associations found among males, should also represent an important contribution to the understanding of individual differences in disgust. The relevance of general disgust sensitivity and particularly of death sensitivity in conjunction with display of animality in meats may also be a finding of value for both research and practice.

Methodologically, this dissertation has introduced sensory analysis (both objective and subjective) into research in marketing. There is much to be gained from a closer integration between psychophysical and marketing research to provide a deeper understanding of acceptance of food products. According to Meiselman (1994) "this integration can be achieved if research paradigms and practical applications are broadened". According to Grunert (2003) sensory science can be useful in the understanding of taste and other sensations from consuming and thus aid in the understanding of future purchases in the market place. In future it can be useful to profile and understand various consumer segments in a multi-methodological way, to meet the challenges in the market and relate to current consumer trends.

With this dissertation we have contributed to the knowledge about disgust provoking stimuli within meat consumption, disgust and its personal antecedents, and the sources to individual differences in disgust with meat. Furthermore, one contribution to the disgust theory is that we have provided a specific food-related context for studying this emotion.

## **Limitations of the studies**

The dissertation has to be seen in light of its limitations. First of all these symbolic and sensory meanings attached to meat are constructed through cultural learning, thus the focus on disgust will vary between cultures. The data in the studies represent a typical north European country, and the findings are only applicable to the Norwegian culture of consumption, particularly among the young female population. Nevertheless, females are still a segment that has to be understood, taking into account that it is expected that females still will hold a primary position as decision makers within the households. Furthermore, other countries with similar cultural characteristics may find the results from this dissertation applicable as a starting point for further study.

This dissertation has addressed disgust targeted to meat treated in the narrow Rozinesque conceptualisation of disgust, as opposed to the broader conceptualisations found in the disgust literature (e.g., Miller, 1997). This makes our results only transferable to the animal food domain, and the generalisability of our findings to consumption products outside this domain is therefore limited. In the western world today we are constantly advised and informed about foods' negative consequences for health and body (Lupton, 1996). This has led to anti-consumption activities such as deliberate weight loss behaviour, aversions or restricted eating of specific foods (Martins, Pliner, & O'Connor, 1999; Mooney & Walborn, 2001; Thompson & Hirschman, 1995). The understanding of food behaviour would be increasingly important due to this fact, also from a marketing perspective.

The studies in the dissertation used a cross sectional research design and only represent snap shots of the phenomenon under investigation. The ability to draw inferences about the casual influence is therefore limited in cross-sectional studies and represents a threat to the internal validity.

The food arena provides opportunities for disgust to occur, but negative emotions like disgust may be hard to capture in research. The food related perspective of disgust has broadened the antecedents for this emotion, as it acknowledges sensory affective taste motivations as well as bodily consequences following ingestion. However, there is an important human and ethical dimension worth addressing with respect to studying disgust in consumption situations like tasting, with reference to the third proposition developed. No matter how interesting it would be to investigate the perceptions of sensory attributes in contribution to the disgust response, it would, from a researcher's standpoint, be unethical to ask respondents to taste meat and indicate their disgust. Thus, the emotional response measurement recorded from meat eaters in the third study was focused on sensory dislike, rather than on experienced disgust. Paradoxically, this leads us to conclude that food-related disgust can hardly be measured in real eating situations, as it is unlikely that consumers will engage in behaviours they may find disgusting. This aspect is closely related to the philosophical discussion on the definition of disgust in psychological theory; see further down.

Similarly, in the fourth paper high and low levels of animality were manipulated with the intention to provoke and measure disgust. Again, these stimuli were manipulated at relatively low absolute levels compared to "real life" disgust elicitors. Obviously, to conduct research that may violate the consumers' well-being was neither the intent nor the interest of this research. It can therefore be worth noting that even though the independent variables were constrained and the effects in the study were small, the operationalised variables worked as expected.

The investigations and manipulation procedures in the studies are all performed in unnatural and rather artificial research settings. This can pose a threat to the external validity of the findings, in that there is a risk that the findings can only be specific to the testing situation. As a defence for the decisions regarding testing conditions, the research has to sacrifice external validity for the need to obtain the effects under more controlled and restrained settings, as disgust in its research nature might present some ethical problems. Furthermore, this is one of the first attempts to explore food-related disgust, and should be regarded more as a necessary step before performing research in more real life settings. Even though the studies may threaten the external validity of the research, we think that the results from this dissertation are moderately relevant to any meat presentation in a purchase setting, and in advertising, as well as in preparation and eating of meat.

According to Cook and Campell (1979) there are also threats to construct validity due to effects of testing. For example, the employment of one measure to represent a variable may under-represent the construct's dimensionality (study 3-only one measure for the dependent variable); and the use of different measures to represent the construct of disgust across studies (disgust conceptualised in study 2 versus study 4) represents a threat by their inconsistency in describing the construct disgust. However, doing research is an ongoing learning process where one's goal is always to find better representations of the concept under study. In conclusion, with regard to all the different definitions of disgust found in the psychological literature, and the expression of disgusting experience in our culture, we have made an attempt to capture some aspect that we have found relevant for the various studies.

The qualitative study offered a contextual platform for later ideas and subsequent papers in the dissertation. However, situational and cultural factors were not taken further and tested in later papers, as there are probably other factors that can intervene and influence the selected variables and proposed relationships. Instead, we interpret the findings as embedded within the cultural context. This is so, because it may be a difficult task to characterise valid contextual or situational factors. Although they are part of the environment, they are also, according to Jacoby (2002), incorporated by the individual and operate internally in the consumer. To keep the design of the studies within reasonable limits we had to sacrifice some variables and input that might have given additional insight on their influence on disgust.

From a philosophical point of view, the theoretical definition developed for disgust in psychology may be problematic. Disgust is defined as arising from intimate interaction with an indigestible or offensive (e.g. disgusting) object. Both Lazarus' (1991) and Rozin and Fallon's (1987) definitions therefore reflect a logical link between the effect (disgust) and the cause of this effect (offensive/indigestible object), which can also be referred to as tautology. A tautology can be understood as a logical statement in which the conclusion is equivalent to the premise (see Popper, 1981). More precisely, the effect is used to identify the cause, and this makes it hard to falsify the statement that the cause (offensive object) has an effect. The theory's status and consequently its operationalisations would be improved by considering how to separate the disgust elicitors more from the effect of disgust itself. However, this dissertation has hopefully contributed positively in this direction by conceptually defining three aspects of animality, which may have a certain generality beyond what we are interested in explaining. This discussion also implies the search for better measurements of disgust to separate this emotion from other affects.

The survey methodology chosen for the second paper has a shortcoming, which according to Cook and Campell (1979) is referred to as “mono-method bias”. This bias refers to presenting all the manipulations in the same manner. The strong relationships between the latent constructs in paper 2 may therefore be due to the fact that we measured disgust with meat, its determinants, and its behaviour related to red meat in the same questionnaire and at the same time. This can make data inherently correlated and lead to artificially strong correlations, and it is a weakness that we are aware of when doing survey research. However we have tried to minimise this weakness by varying positively and negatively worded statements, and we have also followed up this study by letting consumers perceive and respond to “real” stimuli in addition to paper-and pencil variables.

A threat to validity of measurement can come from the construction of verbal scales. We have as far as possible tried to use multiple established scales that have been validated to overcome this problem, but some measures have been modified and new ones have been developed through the research process to suit the different purposes in the papers. Several considerations were taken into account when we developed the measures for the studies. We have investigated the Norwegian use of vocabulary with respect to the topic of disgust (first study). In this process, we discovered that the Norwegian language is not as rich in vocabulary describing disgust; and Norwegian consumers may describe disgust in a slightly different way than consumers using the English language. Therefore, in study 2 we focused more on using the consumers’ own words for expressing the disgust experience when constructing the dependent variable. With regard to the translations of English scales/expressions to Norwegian, all the scales have been back-translated and pre-tested in order to account for possible loss of meaning in translations. We have also pre-tested the items for the variables before the quantitative studies.

In addition to these limitations, each study comprising the dissertation has its own limitations, which have been dealt with sequentially.

## **Managerial implications**

Despite the intangible nature of emotions, the management implications of this research are quite concrete. To develop and sustain market advantages requires an ability to identify and track changes in consumer segments. Because of the individualisation in life-styles and consumption motivations there will be an advantage in understanding the sources of individual differences in consumers' response to foods. In this respect, the consumer scales measuring disgust sensitivity and the meat eating concerns may be adopted by marketers for segmenting the meat consumption market in the future.

We have particularly recognised the nature of the product stimuli, as such to more easily identify the concrete barriers to consumption of meats. By particular focus on the unappealing features of the product stimuli, the marketers may more efficiently identify the untapped possibilities with respect to their products. Hopefully, this dissertation can assist the marketers of meats to comply with the tastes of critical and sensitive consumer segments, females being one such segment. Such "gendered" market segmentation should bring about market opportunities that have not been fully exploited by the meat industry. According to the findings from this dissertation, the market of young females may therefore represent a social barometer for future meat consumption.

The most obvious implication of this dissertation is that modern food producers have to look upon themselves more as designers of experiences, not just producers of commodities. They are responsible for the experiences that consumers have with their food products at every stage of consumer-product interaction. Generally the meat industry is no longer selling pieces of carcasses or animals; it must try to minimise the cues that make the consumers think back to the animal and instead focus on appealing features that make the consumers think forward to the finished meal and the pleasures around consumption.

The goal of marketing is to establish a high preference for the product. However, the effort may fail if one is not aware of the potential aspects that can signal or be perceived in an unintended way. Consumers are rather articulate about what they do not like and often have a great deal to say about why they do not like it. Rozin (1986) has in this respect argued that negative learning in the food domain is much more rapid than positive, and this suggests controlling aversive factors as a success criterion for marketing of animal food products.

Generally, the disgust associated with animal stimuli should encourage product developers to present meat products that are less ‘meat-like’ in appearance and experience. There are some obvious areas for product development that need to be taken seriously, one such being to maximise the tenderness of fresh meats. Constant focus on methods to reduce hard texture has been and still is a critical issue in the meat industry (Sivertsen, Kubberød, and Hildrum, 2002). This encompasses control with variability due to breeding, handling, slaughtering, tenderisation methods, packaging, etc. Production of leaner meats that are presented in an appealing manner without tendons and visible fat would decrease any possible disgust reaction at the time of choice in the shop. Visible blood juices in meat and red colour are clearly critical attributes that need to be controlled in the display of fresh meat products such as through sophisticated packaging technology. Developers should take the opportunity to increase focus on development of new products such as processed meat products, marinated products to increase tenderness and manipulate colour, ready-to-cook /semi-prepared meals, and small product cuttings that can be dropped directly in the pan to minimise consumer handling.

Besides manipulating the physical product itself there are other aspects related to presentation and communication of meat products that should be considered in marketing of meat products. Bearing in mind the negative health aspects and consequences to their bodies that females in particular attribute to meat, focus should be placed on how meat can be presented without connotations of fullness or fat content. Marketers might seriously consider the portion size of meat, due to the fact that young women tend to associate meat with “heavy” food, having negative impact on their stomach feel. Advertising and product development of meat should offer relatively tiny portions of red meat, perhaps in conjunction with other foods with a high health profile.

Space management is important in the shop for every producer, and to avoid rub-off effects from whole, unprocessed meats onto more “deanimalised” processed products, these products should never be displayed in the same counter. Associative conditioning ((Batsell, 1998); (Shimp, 1991) of an appealing meat product with a potentially disgusting meat cut may lead to rejection of the initially appealing meat product at the time of choice in the shop. Obviously, there are also implications for category management. Most importantly, the meats should not be displayed according to which animal they come from, but rather according to preparation possibilities (Examples of categories: Ready to cook category, semi-quick category, traditional category with whole meats, and processed meat category). In this way it is



possible to delight both the traditional, high-experienced consumers as well as the more “disgust-sensitive”.

This research also provides some implications for branding of animal food products. Recently, the trend in Norway in the last years has been to provide consumers with a story about the food in market communication, with special focus on origin marking. In a small market economy like Norway many local producers of foods have adopted this strategy, also with regard to meat products. However, the marketers of animal-derived foods need to be very cautious about the content of their communication. Labelling and advertising showing happy cows with a high “cuteness” factor, personified through naming and with the life story of the animal provided, may actually create the opposite effect of what was intended, thus offending, rather than motivating, consumers. From paper 4 in the dissertation a recent debate was released in the leading newspaper on agriculture in Norway (Bjørheim, 2004) about the consequences of origin marking in branding and market communication of meats.

Meats are always experienced in association with other stimuli that are already more or less liked (e.g., with events, situations, other foods, symbolic features, etc.) (Mela, 2000). It is not until the link between the meat and the negative attributes is broken that any positive representation becomes effective. An initial meat product with potential disgust attributes may be desired if the symbolical features have been manipulated in the right way to incorporate other values. Such values may be prestige, exclusivity, excitement around food and meals, use of reference groups, etc. In this respect we dare to propose a renewal of the association of health with meat. Food classifications tend to change over time (Lupton, 1996), and in the western industrialised part of the world there is nowadays an ongoing reinterpretation of the understanding around health and food. The debate has now turned its focus onto carbohydrates as having negative impact on weight and health, and the advantage of a high protein diet is increasingly promoted. This information may be utilised as a marketing advantage in communication of meat as a high protein, and hence a healthy, food product.

## **Suggestions for future studies**

In addition to improving the limitations that have been addressed, there are several avenues for new research ideas based on this dissertation. We have divided those suggestions into mainly two areas: future research in marketing and future research outside marketing.

### **Future research in marketing**

First, the effect of animality needs to be followed up in more realistic settings in the market place. Second, effects of product display and conditioning effects between various meat products in the meat counters in stores are also interesting aspects that can be manipulated in an experimental setting. The framework and methodology can be transferred to other contexts related to different consumption situations. In this respect, we have at present a forthcoming paper on the effect of animality on disgust in the preparation situation (Kubberød, Dingstad, Ueland, and Risvik, 2004). Third, the renewal of the meaning of health in connection with meat and meat eating should also be thoroughly addressed, at first maybe by using a qualitative approach.

In line with Shimp and Stuart (2004) we also suggest that the managers involved in product development and market communication of animal-derived foods should always and routinely include measures of disgust in testing of their products and market communication contents. This is to check if their food products or market activities can activate unintended disgust.

There are probably other arenas for this type of research approach, both within and outside the food domain. With reference to the food-related conceptualisation of disgust, other food products of animal origin such as fish could be investigated by applying the approach for this dissertation. This would be particularly interesting in light of the decline in fresh fish consumption among the younger generation of consumers in Norway (Honkanen and Olsen, 2001). In this respect Olsen, Olsen and Honkanen (2003) found unsavoury taste as the most valid segmentation criterion among young consumers. Other product emotions relevant for consumption products could also be tested within this framework. Besides the food-related domain of disgust, other aesthetic products such as music, design, fashion and art would be a fruitful area for research, taking into account the centrality of sensory modalities and product meaning in aesthetic

experiences (Hirschman, 1983; Hirschman and Holbrook, 1982). The framework for this dissertation would in addition be valuable in cross-country research to explore cultural differences of disgust with meat.

### **Future research outside marketing**

We also see a potential for studying and modeling other psychological theoretical phenomena from this dissertation. For instance, the theoretical departure derived here can be of value to understand the antecedents of “self-disgust” and rejection of own body in the prediction of eating disorders. In modern western culture, the link between food and body imply ascetic as well as aesthetic aspects. This is so because the social pressure on the outward presentation of slim bodies is understood as a reflection of the inner body and its personality (Lupton, 1996). Therefore, the body becomes a task of management and an object where the individual can exert control and self-discipline. According to Thompson and Hirschman (1995), this perspective on the body assumes that the material body can be regarded as separated from the self. Thus the body becomes an object and a matter outside the self that can be managed constantly to conform to cultural standards. Such “dark sides of consumption” may use a similar theoretical approach as the one employed in this dissertation to build understanding of self-disgust and eating disorders; a serious problem in the modern world.

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