Nourishing Change: Gender Perspectives on Meat Consumption and the Path to Sustainable Eating

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ABSTRACT

Title of the dissertation: “Nourishing Change: Gender Perspectives on Meat Consumption and the Path to Sustainable Eating”

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Despite clear evidence of its negative environmental and health impacts, global meat consumption continues to rise. This trend underscores the urgency of reducing meat intake for both ecological and public health benefits. In this context, understanding the factors influencing meat consumption is vital. This dissertation examines the influence of gender identity on meat consumption patterns within the German population, particularly focusing on the disparity between men and women's consumption rates.

The study employs quantitative methods, gathering primary data through an online experimental study. Data was then analyzed using descriptive and multivariate statistical techniques. Results reveal that, on average, German men consume more meat, especially red meat, compared to women. They also display higher levels of meat attachment and are less inclined to reduce their consumption.

Exposure to a message about the health and environmental effects of eating meat was found to significantly increase the intention of more feminine-identified participants to reduce their already low levels of red meat consumption. However, this intervention did not have a similar effect on the more masculine-identified or gender-ambivalent ones. Another key finding relates to the mediating role of meat attachment in the influence of gender identity on intention to reduce red meat consumption. This implies that communication strategies seeking to lower meat consumption should target changing meat attachment, with a special focus on adapting messages to different gender identities.

This study highlights the need for future meat-reduction interventions to better address gender issues and roles, particularly when targeting men.

Keywords: meat consumption, meat reduction, red meat, gender identity, intention to reduce meat consumption

SUMÁRIO

Título da dissertação: "Mudança Nutritiva: Perspectivas de género sobre o consumo de carne e o caminho para uma alimentação sustentável"

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Apesar de provas claras de impactos negativos no ambiente e saúde, o consumo mundial de carne continua a aumentar. Isto sublinha a urgência de mitigar este fenómeno, tanto por razões ecológicas como de saúde pública, sendo vital compreender o que o determina. Esta dissertação estuda a influência da identidade de género no consumo de carne na população alemã, concentrando-se na disparidade observada entre homens e mulheres. Para o efeito, aplicaram-se métodos quantitativos, recolhendo dados primários através de um estudo experimental on-line, que foram depois analisados com técnicas descritivas e multivariadas. Os resultados revelam que, em média, os homens alemães consomem mais carne, especialmente carne vermelha, que as mulheres. Também exibem maior apego à carne e estão menos inclinados a reduzir o seu consumo. Verifica-se ainda que a exposição a uma mensagem sobre os efeitos do consumo de carne na saúde e ambiente aumenta significativamente a intenção dos que se identificam mais com a identidade feminina de reduzir o seu já baixo consumo de carne vermelha. No entanto, esta intervenção não tem igual efeito nos restantes. Outro resultado importante relaciona-se com o papel mediador do apego à carne no efeito da identidade de género na intenção de reduzir o consumo de carne vermelha. Estratégias de comunicação visando este objetivo devem promover assim a alteração do apego a este alimento, através de mensagens adaptadas à identidade de género. Este estudo salienta a necessidade de futuras intervenções neste domínio levarem em conta as especificidades de género, especialmente quando dirigidas aos homens.

Palavras-chave: consumo de carne, redução do consumo de carne, carne vermelha, identidade de género, intenção de reduzir o consumo de carne

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CHAPTER I: INTRODUCTION

1.1 Background and Problem Statement

Human meat consumption dates back thousands of years and is considered a key element of our evolutionary development and heritage (Leroy & Praet, 2015; Smil, 2002; Stanford & Bunn, 2001). Once a rare, precious resource, the consumption of meat has continued to rise steadily since the early 20th century (Chopra et al., 2002; Delgado et al., 2001; Popkin, 2008). For 2023, the Food and Agriculture Organization of the United Nations (FAO) forecasts a new peak in global meat consumption amounting to 364 million tonnes. Compared to 2001, this represents an increase of 51% (FAO, 2023).

However, the consumption of industrially produced meat is now, more than ever, linked to growing concerns for environmental sustainability and public health. Industrial meat production is one of the more serious factors driving climate change (de Boer et al., 2013; Gerber et al., 2013; IPCC, 2019). Furthermore, high dietary intakes of red and processed meats have been associated with an increase in cardiovascular disease, type 2 diabetes, colorectal cancer and obesity (IARC, 2015; Wang et al., 2015; WHO, 2023).

Despite current knowledge and increased public awareness of the consequences of excessive meat consumption, meat intake continues to rise (FAO, 2023). In 2022, meat intake amounted to 42,6kg per person, almost double the recommended level of the EAT-Lancet Commission (FAO, 2023). In Germany, meat consumption reached a historic low in 2022. Despite this decline, per capita meat consumption amounted to 53,0kg in 2022 (BMEL, 2022). This is higher than the global average meat consumption and far above the value recommended by the EAT-Lancet Commission.

To meet the Paris Agreement on Climate Action and UN's Sustainable Development Goals (SDGs), it is essential to transition towards a more sustainable food system. This entails reducing the consumption of industrially produced meat (IPCC, 2019; UN, 2019). Changing individual eating habits is complex, however, as these are influenced by a variety of factors, including social environment, taste preferences, food supply systems and even logistics (Köster, 2009).

Meat consumption is a dietary habit that, especially in Western societies, is highly ideologically and emotionally charged, and carries a strong symbolic meaning (Hartmann, 2020; Murcott & Fiddes, 1992). In this context, gender plays an important role. Numerous studies and statistics show a clear gender gap in attitudes and behavior towards meat consumption, with men not only consuming more meat than women, particularly red meat,

but also being less willing to reduce their meat intake (Gossard & York, 2003; Graça et al.,, 2015; Rosenfeld & Tomiyama, 2021; Sobal, 2005). In Germany, for example, men consume twice as much meat as women (BMEL, 2022). However, this has not been attributed to a biological necessity, as male physiology does not demand greater consumption of meat (Sumpter, 2015). Rather, it suggests an influence of cultural norms, particularly those relating to the conception and role of masculinity (Sobal, 2005).

Masculinity and meat consumption are closely linked in the history and culture of most Western countries (Rothgerber, 2013; Schösler et al.,. 2015). Indeed, meat consumption has been associated with notions of wealth, masculinity and power throughout European history (Ruby & Heine, 2011). Studies have shown that these associations persist to varying extent today, with many (but not all) men still believing that eating meat makes them stronger and more masculine and is thus an integral part of their identity (Love & Sulikowski, 2018).

As the concept of masculinity has become increasingly hybrid and inclusive over the past decades, allowing for the emergence of "new" forms of masculinity, many men no longer identify with traditional views and their consumption associations (Anderson & McCormack, 2016; Bridges & Pascoe, 2014). Hence, in exploring patterns of meat consumption, it is important to focus not only on the difference between the biological sexes i.e., men and women, but also on the different nuances of masculinity and femininity today.

A study by De Backer and colleagues (2020) revealed that men who identify more with non-traditional forms of masculinity are less attached to meat consumption and likely more inclined to reduce it, than their more traditionally minded counterparts. They are also more positive about leading a vegetarian diet (De Backer et al., 2020). More recent research on consumer attitudes and intentions towards meat consumption by Stanley and colleagues (2023), specifically a survey conducted among a large sample (n=4 897) of Australian men and women, uncovered that men that identified themselves as very masculine were more likely to be reluctant about reducing their meat consumption than the remainder.

Most studies on the influence of gender on meat consumption focus on men and their gender identity, with women, who may also identify with the more "classic" male identity, being hardly ever investigated (De Backer et al., 2020). Most research has so far addressed meat consumption in generic terms, neglecting that there are important differences in red *vs* white meat consumption between genders and thus potentially also between gender identities (Rosenfeld & Tomiyama, 2021). The present study aims to fill these research gaps by investigating the influence of gender identity of both men and women on the consumption of different types of meat.

Being a largely automated and habitual behavior, transforming the habit of meat consumption towards a healthier and more sustainable level can be a very challenging task (Godfray et al., 2018; Rees et al., 2018; Stoll-Kleemann & O'Riordan, 2015). Media can take a central role in this endeavor by shaping, popularizing, and challenging the social connotations associated with meat (Burgess, 1990; Morris, 2017; Khazaal & Almiron, 2016; Cole & Morgen, 2011). Effective marketing and communication strategies therefore provide an opportunity to change meat consumption patterns for the better. However, their success depends on tailoring the messages in a way that will resonate with the target audience. A thorough understanding of message recipients and the elements that influence their attitudes towards meat consumption is thus crucial (Cheng et al., 2011; White et al., 2019).

Existing literature provides limited insight on the effectiveness of messages promoting a reduction in meat consumption (Graça et al., 2015, 2019; Harguess et al., 2020; Kwasnya et al., 2022). Several studies uncovered that men hold different attitudes towards meat consumption compared to women, being thus also differently motivated to reduce it (Graça et al., 2015, 2019; Kwasnya et al., 2022; Peeters et al., 2022; Rothgerber, 2021; Rosenfeld & Tomiyama, 202; Stanley et al., 2023). For example, women are more likely to adopt a vegetarian diet out of concern for animal welfare, while men are more often motivated by health benefits (Rosenfeld & Tomiyama, 2021). Despite this knowledge, research into the role played by gender and gender identity in moderating the impact of meat reduction interventions remains scarce.

1.2. Aims and Scope

This dissertation aims to investigate the role of gender identity on meat consumption as well as analyze the effectiveness of various meat reduction messages tailored to gender identity on intention to reduce red meat consumption among non-elderly German adults. Ultimately, it seeks to contribute to the development of communication strategies promoting meat consumption reduction. To this end, the following research questions are addressed:

RQ1: Does gender identity influence the consumption of different types of meat amongst German men and women?

RQ2: How does gender identity affect the response to messages encouraging reduced red meat consumption among German men and women?

1.3. Research Methods

A deductive, explanatory research approach collecting and analyzing primary quantitative data from subjects was chosen to answer the proposed research questions. First, the relationship between the main independent variable – gender identity – and the frequency of consumption of different types of meat was investigated through self-reporting in an online survey. Secondly, the effects of exposure to messages based on different types of appeal on individuals' level of meat attachment and the associated intention to reduce meat consumption were tested with an online experiment. In addition, the potential moderation effect of gender identity on responses to message exposure was assessed. The demographic target group for this study included both women and men, who either held German citizenship or had lived in Germany for a minimum of ten years, described themselves as meat eaters and were aged between 18 and 67 years. The data collection was followed by a detailed analysis and interpretation using the statistical software IBM SPSS version 28.

1.4. Relevance

This dissertation addresses current consumer and market trends in the food industry and retail sector, where sustainability and health are becoming increasingly important drivers of demand (Guillaumie et al., 2020). Although a reduction in meat consumption is essential from both a health and an environmental perspective, this is not yet implemented by the general public, with too much meat still being consumed (Rust et al., 2020). Looking at the consumption figures for meat, it seems that men, who consume twice as much meat as women in Germany, find it also much more difficult to reduce their meat consumption (Koch et al., 2019; Schösler et al.,. 2015). Understanding the potential link between gender identity and meat consumption could provide insights on how to engage this high meat-consuming population and develop more effective efforts to convince it to change this behavior. Effectively targeting men, who make up about half of the population, can play a relevant role in achieving health and sustainability goals that would benefit society as a whole (Schösler et al., 2015). Furthermore, companies active in the meat alternatives sector could benefit from a deeper understanding of the masculine-identified target group. Being able to effectively target them with tailored marketing messages could unlock an untapped market segment, contributing to the growth and success of their businesses.

1.5. Dissertation Outline

The following chapter presents a review of existing work on the influence of gender and gender identity on meat consumption, as well as on the effectiveness of different messaging strategies to promote the reduction of meat consumption. Subsequently, Chapter III describes the research approach undertaken, applied to determine the role of gender and gender identity on meat consumption and meat reduction messaging effectiveness. The key findings of this study are presented in Chapter IV. Finally, Chapter V presents the main conclusions and managerial implications of findings, highlights some limitations of the study performed and provides recommendations for future research.

CHAPTER II: LITERATURE REVIEW

2.1. Meat Overconsumption: A Barrier to Climate Goals

The consumption of meat by humans has been rising steadily since the 20th century. In 2023, this consumption has reached a new annual peak, thereby reaching excessive proportions (Chopra et al., 2002; Delgado et al., 2001; FAO, 2023; Popkin, 2008). Such development has negative consequences both for human health and the environment (de Boer et al., 2013; Gerber et al., 2013; IPCC, 2019; WHO, 2023). Finding ways to reduce the consumption of industrial meat and establish a predominantly vegetarian diet in society is essential to achieve the Paris Agreement's climate goals and the Sustainable Development Goals (SDGs) (IPCC, 2019; Tilman & Clark, 2014; UN, 2019; Willett et al., 2019).

2.2 Meat Consumption Reduction: Progress and Gender-Based Differences

Germany recorded its lowest level of meat consumption in 2022 since consumption calculations began in 1989 (BMEL, 2022). In this year, the average meat consumption per capita stood at 52,0kg. Nevertheless, such figure still makes Germany one of the top meat-consuming countries in the world (FAO, 2020). The reduction in consumption was highest for pork meat, falling by ca. 2,8kg per person compared to 2021. Nevertheless, pork still accounted for over half of the total meat consumption in Germany. The second most consumed type was poultry, with an average value of 12,7kg per capita. This represented a decrease of 400g relatively to 2021(BMEL, 2022).

Although meat consumption in Germany has been steadily declining over the years, the current per capita consumption is still 136,0% above the level recommended by the EAT-Lancet Commission (FAO, 2023) of 22,0kg per person per year. Additionally, the Food-Based Dietary Guidelines in Europe advise that Germans should limit their individual intake of prepared meat (low-fat) and cold cuts to a range of 14,4-28,8 kg per year, including a moderate consumption of sausages. They also recommend the consumption of poultry to be preferred over that of beef or pork. In view of the meat consumption statistics and patterns prevalent in Germany, it can be concluded that nutrition guidelines and recommendations are far exceeded and thus generally disregarded in this country (FBDG, 2023).

Available global statistics show that men generally eat more meat than women, a trend that has remained stable over the course of decades (FAO, 2023). Furthermore, numerous studies uncover important gender effects on meat consumption (Gossard & York, 2003; Graça et al., 2015; Sobal, 2005). Such gender differences are equally observable among the German

population. The National Meat Consumption Study II, which surveyed 8 278 German women and 7 093 German men on their daily meat consumption between 2005-2006, found that women ate around 83g of meat per day. Meanwhile, men ate almost twice as much, with their average meat intake reaching 160g per day (Heuer et al., 2015). In line with this, the willingness to pursue vegetarian or vegan diets also appears to be smaller among men than women (Rosenfeld & Tomiyama, 2021). Indeed, 12% of German women report to currently follow a vegetarian diet, against only 6% of German men (BDL, 2023).

Noticeably, research shows that while men's higher meat consumption applies to all types of meat, the differences between genders in the consumption of red meat, i.e., pork or beef, are significantly more pronounced than in the consumption of white meat, such as chicken or turkey. One potential explanation for these disparities could be a stronger association between red meat and the Western image of masculinity than is the case with white meat (De Backer et al.,, 2022; Rosenfeld & Tomiyama, 2021). Another hypothesis is that women might be more inclined to consume processed meats, or those without visible traces of blood, and avoid meats that overtly resemble their animal origin, such as rare steaks, to dissociate this food from its animal origin (Kwasnya et al., 2022; Rothgerber, 2023). Nevertheless, it is important to mention that most studies investigating gender differences in meat consumption generally did not analyze the consumption of different types. There is thus limited knowledge about this topic.

2.3 The Role of Meat Attachment: Gender Differences

Both the level of meat consumption and the willingness to reduce it rely heavily on an individuals' attitude and involvement with meat consumption. Such psychological drivers and their effects are subsumed in the concept of "meat attachment" (Graça et al.,, 2015). Meat attachment varies on a continuum between disgust/aversion/rejection of eating meat and a strong feeling of emotional and physical dependence on a meat-dominated diet. One's degree of meat attachment seems to play an important role in determining one's level of meat consumption. Individuals who exhibit higher meat attachment levels expectedly eat meat more often, have more positive attitudes towards meat consumption, identify themselves more readily as meat eaters or omnivores, feel more social pressure to eat meat and exhibit strong values of human dominance over animals than the remainder (Graça et al.,, 2015). Consequently, they also have less intention or willingness to reduce their meat consumption, change their eating habits or adopt a vegan or vegetarian diet. Importantly, men tend to

exhibit higher levels of meat attachment than women, which concurs with their more meat-dominated dietary patterns in general (Graça et al.,, 2015).

2.3 The Interplay of Gender Identity and Dietary Habits in Meat Consumption

Altogether, statistics and research studies clearly demonstrate that important gender differences exist in values, attitudes and behaviors pertaining to meat consumption. Yet, it has been shown that the mere fact of being biologically male does not automatically increase the need for eating meat (Sumpter, 2015). To further investigate the differences in meat consumption and the intention to reduce it, it is necessary to consider related factors that could potentially have an impact, in particular gender identity.

Gender identity refers to a person's self-image as being female, male, a combination of both or something else, and can correspond to, or deviate from the physical sex (Roselli, 2018). The development of gender identity is a process for which science has not yet found a clear explanation, with views varying from the belief that gender identity is determined at birth by genetic and other biological factors, to the belief that gender is mainly a social construction (Encyclopedia Briannica, 2023; Roselli, 2018). Social identity theory, for instance, argues that gender represents a form of social identity rooted in the masculinity and femininity roles displayed and accepted in society (Tajfel & Turner, 2004). Violating one's gender role as socially determined - for instance, that men should be masculine and women should be feminine - can lead to one experiencing identity threat and social rejection, which individuals generally strive to avoid (Goffman, 1976; West & Zimmerman, 1987). Maintaining a socially acceptable gender presentation can therefore require one to conform to gender norms visibly and consciously, to meet societal expectations (Goffman, 1959).

Gender identity was found to exert a significant influence on consumer behavior, among others by shaping information processing, social behavior, and attitudes (Ye et al., 2021). Some studies indicate that individuals who strongly identify with their gender identity tend to choose products that are considered congruent with such identity (Rogova & Matta, 2022, Ye et al., 2021). Importantly, just as products or brands can be categorized as masculine or feminine by consumers, so can several dietary practices. Stein and Nemeroff (1995) found that a healthy diet of whole meal bread, salad, fruit, potatoes and chicken was considered less masculine and thus less appealing than an unhealthy one where chips, steak, sundaes, donuts and hamburgers prevailed. This shows that eating practices play a role in how masculine or feminine one appears and thus contributes to a person's gender identity (Thomas, 2016).

In many cultures, masculinity is highly dependent on presentational factors, being acquired, for example, through competition, social behavior and aggression (Gilmore, 1990; Kimmel, 1996; Vandello et. al, 2008). In this sense, masculinity, unlike femininity, is seen as a rather precarious state that is subject to loss and thus in need of constant reaffirmation (Vandello et. al, 2008). Consequently, men tend to be more susceptible to threats to their gender identity than women (Vandello & Bosson, 2013; Vandello et al.,. 2008). Meat consumption might be an important means by which men can perform and reaffirm their masculinity and thereby maintain their gender identity (Ruby & Heine, 2011). In this context, abstaining from eating meat may represent a threat to masculinity. By blurring gender identities, the notion of meat avoidance may make men fear that adopting such practice will lead them to no longer be seen as "real" men in the traditional sense (Rothgerber, 2020; Rosenfeld & Tomiyama, 2021). This belief can in turn pose a real barrier to meat reduction at population level (Kildal & Syse, 2017). Indeed, the link between dietary practices and gender identity appears to be quite strong in the case of meat consumption (Chuck et al.,, 2016; Rosenfeld & Burrow, 2017). In Western cultures in particular, meat is strongly associated with masculinity, strength, and power (Ruby & Heine 2011). Vegetarianism on the other hand is closely related to the social concept of femininity (Adams, 1990; Mycek, 2018; Sobal, 2005).

An important point to make is that the concept of masculinity, as linked to meat consumption by research, often refers to the traditional hegemonic, cisgendered masculinity. Cisgender individuals include those whose gender identity corresponds to the sex assigned to them at birth (Connell & Messerschmidt, 2005). This idea of men and masculinity primarily represents the norms of male behavior, as they are culturally idealized, being typified by strength, dominance, emotional restraint and heterosexuality. However, it is equally important to note that not all men identify with this form of masculinity. Especially over the past decades, the concept of masculinity has been increasingly subject to change, becoming simultaneously less clear cut and more inclusive (De Backer et al.,, 2022).

More and more research has been exploring whether and how different forms of masculinity and femininity are related to meat consumption. Recent studies have uncovered the existence of strong positive associations between the degree of identification with traditional, hegemonic male gender roles and meat attachment or consumption, on one hand, and of strong negative associations with willingness to reduce current meat intake or adopt a vegetarian or vegan diet, on the other (De Backer et al.,, 2020; Ruby & Heine, 2011; Stanley et al.,, 2023; Tuohy, 2021; Rosenfeld & Tomiyama, 2021; Rothgerber, 2013). Furthermore, Rothgerber (2013) found that the more individuals identified with traditional masculine

norms, the higher their pro-meat-consumption attitudes. Men who identified more strongly with non-traditional, new masculinity roles, on the other hand, were found to consume less meat, exhibit less attachment to meat and adopt a more positive attitude towards a vegetarian diet (De Backer et al., 2020; Ruby & Heine, 2011; Rosenfeld & Tomiyama, 2021).
Very few studies within the realm of gender identity-related meat consumption research have included women as object of investigation. One exception is the work conducted recently by Stanley and colleagues (2023), who found that, similar to men, women who identify more strongly with traditional views of their gender are also more strongly attached to meat than their counterparts, being equally heavier consumers of meat, as well as less inclined to change this behavior or consider the adoption of meat-free diets. Furthermore, expected associations between gender identity and meat-consumption related variables were found in the case of both red and white meats, albeit being more evident for red meat (Stanley et al., 2023). This study also showed that both women who classified themselves as very traditionally feminine and men who classified themselves as very masculine considered meat consumption to be more natural, beautiful and necessary than the remainder (Stanley et al., 2023). These findings raise the question of whether it is perhaps not necessarily the fact of being male that leads to higher meat intake, as women's femininity is similarly (and often just as strongly) associated with meat-related attitudes. More likely, it is potentially the traditional expression of the respective gender identity that plays a role in meat-related behavior, for both genders. Due to the lack of studies in this area, further research is necessary to support this hypothesis.

2.4 Gender-Specific Messaging Strategies in Meat Consumption

Targeting communication and messaging strategies is instrumental in persuading populations to make desired behavioral changes, such as reducing their meat consumption (Kwasnya et al., 2022). To ensure effectiveness, which includes message acceptance and subsequent positive behavior change, messages must be appropriately tailored to the recipient (Entman, 1993). Gender and gender identity appear to be factors that strongly influence meat consumption patterns, the willingness to reduce meat consumption and the attitude towards meat. It is thus relevant to investigate the effectiveness of messaging strategies tailored to gender and gender identity in the area of meat reduction and general food behavior change.

2.4.1 Changing Beliefs: Providing Information on Behavioral Consequences

Providing individuals with information about the negative effects on health and the environment of excessive meat consumption and associated intensive animal farming is likely

an effective means to reduce their meat intake (Byrd-Bredbenner et al., 2010; Jay et al., 2019). However, it is important to note that health and environmental appeals appear to be more effective in changing intentions in the case of consumers who already believe in the negative health and climate impacts associated to meat consumption (Vainio et al., 2018; Verain et al., 2017). Moreover, several studies found that beliefs about the ineffectiveness of meat avoidance in reducing climate change, a lack of responsibility for changing meat intake, and a sense of entitlement to meat consumption are all barriers to reducing meat consumption (Bohm et al.,, 2015; de Boer et al.,, 2017; Dowsett et al., 2018; Graça et al., 2015; Macdiarmid et al.,, 2016; Mullee et al.,, 2017; Truelove & Parks, 2012; Viainio et al.,, 2016). Prior studies revealed that women display a higher sensitivity to health messages (Reisch et al., 2017) and higher health awareness than men (Grzymisławska et al., 2020). This suggests a higher responsiveness to health appeals about meat consumption reduction among women. Men are nonetheless more likely than women to cite health reasons for abstaining from meat. Still, health concerns remain the strongest stated motivation for the adoption of meat-free diets in both genders (Rosenfeld & Tomiyama, 2020). Indeed, when comparing message content, health appeals (private benefit) have a stronger effect on the intention to reduce meat consumption than environmental ones (public benefit), for either men or women (Cordts et al., 2013). Moreover, combining environmental and health benefit information in the same message seems to be more effective than framing each individually (Kwasnya et al., 2022). In view of the above, it can be hypothesized that the effects of information-based messages on intention to reduce meat consumption are independent of the gender or gender identity of the target group.

2.4.2 Leveraging the Meat Paradox in Messaging Strategies: Emotional appeals

Moral attitudes and values play an important role in food choices (Graham & Abrahamse, 2017). Meat consumption, in particular, can be associated with ethical issues and moral values concerning the killing and suffering of animals. For example, the mere behavior of eating meat often conflicts with the attitudes people have towards animal welfare (Graham & Abrahamse, 2017; Rothgerber, 2017). This conflict results in what is known as “cognitive dissonance”, a mental state that occurs when one’s personal beliefs do not match one’s actions. This state is unpleasant and creates a desire to reduce it (Harmon-Jones & Mills, 2019; Rothgerber, 2020). In relation to meat consumption, this inner conflict has been described as the "meat paradox" (Loughnan et al., 2010; Rothgerber, 2019; Rothgerber & Rosenfeld, 2021). This paradox reflects the conflict that meat eaters experience when they

enjoy eating meat, but at the same time are aware of the ethical implications of slaughtering animals and factory farming, and sometimes voice concerns about them.

Consumers can resort to a range of strategies to mitigate the psychological discomfort potentially triggered by eating meat, such as avoiding, discounting or disregarding information about farm animal welfare that can induce dissonance. Other possibilities are to diminish the connection between the living animal and the meat eaten, or to deny responsibility for farm animal welfare by dehumanizing or degrading the spirit of animals (Rothgerber, 2014, 2020; Rothgerber & Rosenfeld, 2021). Importantly, the strategies applied to avoid the "meat paradox" appear to differ between men and women (Kwasnya et al., 2022). Men seem to be more inclined to justify their meat consumption resorting to strategies like the denial of animal suffering, offering health or religious motives, or affirming the beliefs that animals are hierarchically inferior to humans and that it is human destiny to consume meat. Women, on the other hand, tend to distance themselves from the animals they consume and avoid thinking about the origin or processing of meat (Rothgerber 2023). In line with this, women are more likely than men to cite concern for animal welfare as a motivation for choosing a vegetarian or vegan diet.

Exposure to messages designed to disrupt meat paradox avoidance strategies could be an effective means of communicating the necessity and benefits of reducing meat intake (Dagevos & Voordouw, 2013). A messaging strategy with the potential to undermine specifically the meat paradox avoidance strategies of women is to evoke emotional response to animals and animal welfare. This appears to effectively trigger ethical moral concerns associated with meat consumption and reduce the detachment from living animals (Kollmuss & Agyeman, 2002; Rothgerber 2023).

Some studies have compared the effectiveness of knowledge-based and emotion-based messages on triggering intention to reduce meat consumption (Berndsen & Van Der Pligt, 2005; Carfora et al., 2019), finding that emotionally formulated messages had a stronger impact than informational ones. Moreover, messages targeting meat reduction seem to be more effective when aiming to trigger negative emotions (e.g., disgust, revulsion, guilt or regret) through increased empathy towards the animal, rather than positive ones (Kwasnya et al., 2022). The former often entail, for instance, descriptions of factory farming, slaughter processes or animal suffering (Anderson & Barrett, 2016; Palomo-Velez et al., 2018) as well as images of unprocessed meat (Kunst & Hohle, 2016; Kunst & Palacios Haugestad, 2018). Indeed, research shows that the negative feelings induced by such messages can lead individuals to view meat consumption as less appetizing, appealing and enjoyable (Anderson

& Barrett, 2016). On the other hand, messages designed to increase closeness and attachment to farm animals – e.g., those talking about animals' personalities, animal-human friendships, animal-animal friendships, or confronting individuals with pictures of cute young and adult animals -, can increase feelings of guilt, empathy and caring for animals. Overall, the triggering of emotions was found to be particularly effective in increasing intention to reduce meat eating among women and those consumers who had little prior exposure to unprocessed meat (Kunst & Hohle, 2016; Kunst & Palacios Haugestad, 2018).

2.4.3 Leveraging Social Norms in Messaging Strategies

Since meat consumption is potentially related to gender identity, which is, in turn, likely to be shaped through social norms, a messaging strategy that leverages social norms could be effective in promoting the reduction of meat intake. Strategies based on the activation of socio-cultural factors aim to confront recipients with social norms that motivate them to adopt the supposedly socially desirable behavior (Kwasnya et al., 2022). Normative influences have already been successfully leveraged in health research, with studies showing that salient social norms can predict smoking among adolescents (Weiss & Garbanati, 2006), condom use (Peterson & Bakeman, 2005), driving behavior (Linkenbach & Perkins, 2006) and general health behavior among men (Mahalik & Burns, 2011).

Research on the use of social norms to change meat consumption remains scarce, however (Kwasnya et al., 2022). One of the few studies that explored socio-cultural factors related to meat consumption was an experiment carried out by Sparkman and Walton (2017), comparing the effects of static and dynamic norms on different scenarios of meat consumption and water conservation. Static norms describe the current state of a behavior that others are already practicing. For example, individuals are confronted with the percentage of people who are currently vegetarians. Dynamic norms, on the other hand, describe behavioral changes from the norm that others are currently performing or considering performing, for instance when individuals are confronted with the percentage of people who have recently become vegetarians. This study found that people were more receptive to messages about the prevalence of vegetarianism when these were framed with dynamic *vs* static norms, with this making them more willing to change their meat consumption. It seems that a message that communicates dynamic social norms concerning the proportion of people who are already reducing their meat consumption could be effective, particularly in the case of men/male gender identities versus women/female gender identities. Therefore, it can be hypothesized that this could be particularly effective for male consumers, as the concept of masculinity is

more performative than the concept of femininity (Gilmore, 1990; Kimmel, 1996; Ruby & Heine 2011; Vandello et. al, 2008).

2.4. Conclusion and Research Hypotheses

The global trend towards excessive meat consumption is having a negative impact on both human health and the environment (Chopra et al., 2002; de Boer et al., 2013; Delgado et al., 2001; FAO, 2023; Gerber et al., 2013; IPCC, 2019; Popkin, 2008; WHO, 2023). Although meat consumption in Germany is declining, it is still well above the standards set by the EAT-Lancet Commission and the European Healthy Eating Guidelines (BMEL, 2022; FAO, 2023; FBDH, 2023). Consequently, it is crucial to encourage people to reduce their meat consumption as part of the wider effort to mitigate climate change (IPCC, 2019; Tilman & Clark, 2014; UN, 2019; Willett et al., 2019).

When devising strategies to achieve this goal, it is fundamental to consider the influence of gender and gender identity on meat consumption habits, as there are clear differences in this regard. Studies and statistics clearly show that men consume significantly more meat than women (FAO, 2023; Gossard & York, 2003; Graça et al., 2015; Rosenfeld & Tomiyama, 2021; Sobal, 2005). This is also the case in Germany, where men consume around twice as much meat then women (Heuer et al., 2015). This higher consumption among men is associated with a stronger attachment to meat and a tendency towards pro-meat attitudes. As a result, men generally show less interest in reducing their meat consumption or adopting a vegetarian diet than women (Graça et al.,, 2015; Tuohy, 2021). However, this disparity is not due to biological needs, as men do not naturally need to eat more meat (Sumpter, 2015).

Gender identity also plays a role in meat consumption (De Backer et al.,, 2020; Chuck et al.,, 2016; Roselli, 2018; Rosenfeld & Burrow, 2017; Ruby & Heine, 2011; Rosenfeld & Tomiyama, 202; Rothgerber 2013; Stanley et al., 2023; Tuohy, 2021). Indeed, some studies show that men who identify strongly with traditional notions of masculinity tend to have an increased meat consumption and a stronger attachment to meat, as well as a lower willingness to limit meat consumption or consider a vegetarian lifestyle (De Backer et al.,, 2020; Ruby & Heine, 2011; Stanley et al., 2023; Tuohy, 2021; Rosenfeld & Tomiyama, 202; Rothgerber 2013). Conversely, men who identify with non-traditional, newer forms of masculinity often show lower meat consumption and are more open to a vegetarian diet (De Backer et al., 2020; Ruby & Heine, 2011; Rosenfeld & Tomiyama, 2021). Similar trends can be observed in women, although research in this area is scarce (Stanley et al., 2023). Furthermore, studies show that women often adopt strategies to disassociate the meat they consume from the

animal itself, thus alleviating the psychological discomfort associated with the "meat paradox". This paradox refers to the cognitive dissonance experienced by meat eaters who enjoy consuming meat but are simultaneously discomforted by the ethical implications of animal slaughter and factory farming (Loughnan et al., 2010; Rothgerber, 2019; Rothgerber & Rosenfeld, 2021). As a result, women may be more inclined to consume processed meats or those without visible traces of blood and avoid meats that overtly resemble their animal origin, such as rare steaks (Kwasnya et al., 2022; Rothgerber, 2023). In sum, there appears to be a relation between gender identity, the type of meat and the corresponding consumption behavior.

Figure 1 illustrates the relationship between gender identity and meat consumption studied in this dissertation, which is assumed to be moderated by the type of meat consumed, i.e., red/unprocessed *vs* white/processed meat.

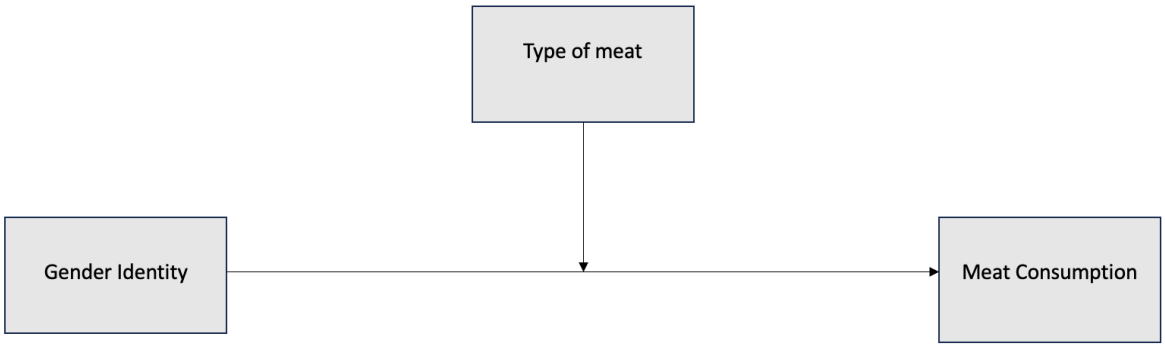


Figure 1 – Hypothesized relationships between gender identity, type of meat (red/unprocessed *vs* white/processed meat) and meat consumption.

Based on this, the following hypothesis is proposed:

H1: The more people identify with a traditional gender role, the higher their meat consumption, with this relationship being influenced by the type of meat consumed. It is expected that the effects of gender identity are stronger for red or unprocessed meats than for white or processed meat.

Targeted messaging strategies can be powerful tools in changing consumer behavior Kwasnya et al., 2022). For messages to be not only recognized but also accepted by their intended recipients, they must resonate with them (Entman, 1993). Such messages typically do not directly change consumers' behavior. Rather, they operate by changing their beliefs and

attitudes towards the behavior or product in question, which then has an impact on their behavior (Graça et al.,, 2015). In the case of meat consumption, this means that effective messages should first be able to change attitudes towards meat, among others, meat attachment, before meat consumption behavior can effectively change (Graça et al.,, 2015). To design such effective message processing, a deeper understanding of the attitudes and behaviors of the target group is required. As gender identity appears to have a significant influence on meat consumption behavior, it seems essential to ensure that this individual difference is taken into consideration when developing consumption-reduction strategies (De Backer et al.,, 2020; Chuck et al.,, 2016; Roselli, 2018; Rosenfeld & Burrow, 2017; Ruby & Heine, 2011; Rosenfeld & Tomiyama, 202; Rothgerber 2013; Stanley et al., 2023; Tuohy, 2021).

A communication strategy that exposes individuals to social norms representing the desired behavior has proven successful in the health domain (Encyclopedia Briannica, 2023; Goffman, 1959; Kwasnya et al., 2022; Roselli, 2018). Since gender identity is shaped by social norms, this approach could be particularly effective when seeking to reduce meat consumption in men, as the concept of masculinity is more performative than the concept of femininity (Gilmore, 1990; Kimmel, 1996; Ruby & Heine 2011; Vandello et. al, 2008). Another potentially effective communication strategy is to drive meat consumers into a state of cognitive dissonance, during which an individual's attitudes and moral beliefs come into conflict with their meat consumption behavior (Graham & Abrahamse, 2017; Loughnan et al., 2010; Rothgerber, 2017, 2019; Rothgerber & Rosenfeld, 2021). Men and women use different strategies to avoid this "meat paradox" (Kwasnya et al., 2022). For both women and men, confrontation with messages about the health and ecological effects of meat consumption has proven to be effective in reducing consumption (Kwasnya et al., 2022). For women in particular, evoking emotional responses related to moral and ethical concerns about animal welfare, by attacking their meat paradox avoidance strategy of distancing themselves from animals, has been shown to be effective (Kunst & Hohle, 2016; Kunst & Palacios Haugestad, 2018).

Figure 2 illustrates the expected impact of targeted meat reduction messages on meat attachment. Changing meat attachment levels should have a subsequent effect on the willingness to reduce meat consumption. In this context, gender identity potentially plays a moderating role, as it is assumed that it influences the strength with which the different meat consumption reduction messages may affect meat attachment, and through this affects the intention to reduce meat consumption.

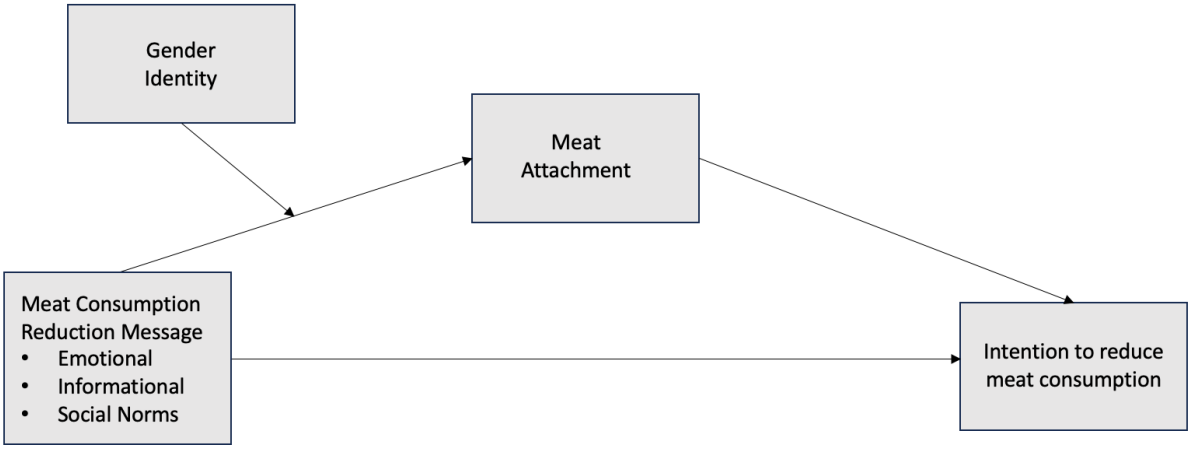


Figure 2 - Relationships between meat consumption reduction message, gender identity, meat attachment and intention to reduce meat consumption.

Based on this, the following hypotheses are proposed:

H2: Exposure to messages incentivizing the reduction of meat consumption decreases the level of meat attachment, thereby increasing the intention to reduce meat consumption.

H2a: Exposure to an informational message about the health and environmental impacts of meat consumption is equally effective in decreasing levels of meat attachment and increasing the intention to reduce meat consumption among men and women.

H2b: Exposure to a message that leverages dynamic social norms decreases the level of meat attachment and increases the intention to reduce meat consumption more among men than women.

H2c: Exposure to a message that evokes an emotional response to animal welfare decreases the level of meat attachment and increases the intention to reduce meat consumption more among women than men.

CHAPTER III: RESEARCH METHODOLOGY

3.1. Research Approach

As the goals of this dissertation were to assess the strength of relationships between gender identity and the consumption of different types of meat, and subsequently test the role of gender identity as moderator of the impact of different message strategies on meat attachment and intention to reduce meat consumption, an explanatory research approach was undertaken. Based on an extensive review of academic literature, a number of testable hypotheses were formulated in Chapter II, namely about the cause-and-effect relationships between gender identity and meat consumption, as well as the effectiveness of different messaging strategies in raising the intention to reduce meat consumption in the future, given changes operated in meat attachment moderated by gender identity. Furthermore, these hypotheses were tested using deductive quantitative research methods. To this end, quantitative primary data was collected through an online survey and an experiment administered through Qualtrics' survey software, and subsequently subject to descriptive and multivariate statistical analyses.

3.2. Study and Survey Design

According to the research hypotheses set forward in Chapter II, the core of the study was a single-factor experimental treatment consisting of three levels, administered randomly between-subjects: an informational message (Message 1), an emotional message (Message 2) and a dynamic norms message (Message 3). The three messages were developed in German, based on the findings of extant research on the effects of different communication strategies seeking to reduce meat consumption. To engage participants and increase the attention paid to the messages, these were delivered in the form of recorded PowerPoint presentations with voice over and key message elements gradually being displayed. German and English versions of the messages are provided in Appendix I, together with links to the presentations.

This experiment was administered as part of an online survey herein briefly described. Following a short introduction, provision of informed consent and assessment of study eligibility by three screening questions (nationality/residency status, age and type of diet), eligible respondents were asked about their frequency of consumption of red meat as well as their frequency of consumption of different types of meat. They were then randomly exposed to one of three stimuli-messages. Subsequently, data on the main dependent variable, intention to reduce red meat consumption, was collected. Next, psychometric measures of meat attachment (Künh et al., 2023) and gender identity (Kachel et al., 2016), previously developed

and validated for the German population, were administered. The survey ended with two demographic questions on income and state of residence. In line with the conceptual models depicted in Figures 1-2, the following variables were assessed as dependent variables: the frequency of consumption of different types of meat (white *vs* red meat; unprocessed *vs* processed meat servings) during the previous month, the level of respondents' meat attachment and their intention to reduce the consumption of red meat in the following 6 months. In addition, gender identity was assessed as independent variable and data was collected on a number of demographic, socio-economic and dietary characteristics. A print-out of the survey (in German) is provided in Appendix II; Appendix III describes the measures administered (in English).

3.3 Population, Sample and Administration

The study population was defined as German citizens (or individuals residing in Germany for more than ten years) with internet access, ranging from 18-67 years old and reporting themselves as omnivores or flexitarians. The survey was disseminated to author contacts by personal communication, email and social media, in order to recruit eligible participants. A voluntary (i.e., convenience) sample of n= 369 individuals accepted the author's invitation to complete the study and provided informed consent to participation.

The fulfillment of the population eligibility criteria was assessed at the start of the survey through the administration of corresponding screening questions. Respondents reporting not to meet the criteria (approximately 14%) were sent to the end of survey, informed that they did not match the required study population, thanked, and dismissed. Data already collected were not entered in the main analyses. An additional 78 individuals were enlisted through Prolific (https://www.prolific.com/) using predefined filters for age, residence and diet to match population requirements. Prolific is an online platform designed for academic research, offering researchers access to a diverse pool of paid participants for surveys and studies. Irrespectively of mode of recruitment, the study was administered as part of the same online survey programmed and distributed using Qualtrics software (except for screening questions which were not administered to participants recruited by Prolific).

In addition to the measures detailed in Appendix III, the survey included three attention control checks to improve the quality of the data collected. As assurance that treatment messages were watched attentively, their presentation was followed by a question in which respondents had to indicate whether the Eurovision Song Contest was discussed in the message they had just seen (it was not). Moreover, the meat attachment and gender identity scales administered each included one standard attention control item. Respondents failing any of the three attention

checks were sent to the end of survey, informed that their answers did not match the required data quality, thanked, and dismissed. Data already collected were not entered in the main analyses. Appendix IV further details numbers and reasons for participant exclusion. Excluded participants were not prevented from attempting to retake the survey.

A grand total of 234 participants (including 72 recruited by Prolific) met the population requirements and completed the entire study supplying valid responses for analysis. A post-hoc study power analysis was conducted using G-Power for ANOVA: fixed-effects (two factors, each with three levels), special, main effects and interactions. Results are shown in Appendix V, indicating that for an α of 0,05% and a medium effect size *f* of 0,25, $n = 234$ should provide sufficient power for the intended analysis ($1-\beta = 0,87$). Moreover, the exclusion of some respondents due to failing attention checks did not cause important imbalances in the final allocation of treatment messages, which is detailed in Appendix VI.

Table 1 describes the demographic, socioeconomic and dietary characteristics of the sample, discriminated per gender. Slightly more men than women took part in the survey, with respondents' age averaging ca. 40 years in both cases. Almost half of the participants stated that they had completed a higher education degree. The majority of respondents (ca. two-thirds) stated that they currently lived in a household with a monthly net income ranging between €2,000 and €5,999. Geographically, the south of Germany (Baden-Württemberg and Bavaria) was the most represented region in the sample (ca. 70%). Nearly 90% of respondents classified themselves as omnivores, with a nearly equal proportion reporting to consume beef or pork several times a week.

Most variables were distributed evenly across genders (Table 1). Mean age and confidence interval revealed no significant gender differences at the 5% level. Meanwhile, significant gender differences were found in dietary behaviors. Namely, men reported themselves as frequent red meat eaters much more often than women (52,4 % vs 33,9 %, respectively). Conversely, the proportion of women who stated that they did not frequently eat red meat (10,3%) was much higher than that of men (3,5%). A similar pattern can also be observed with regard to general dietary habits. The majority of men (53,6%) reported an omnivorous diet, compared to 35,6% of women. Interestingly, the concept of flexitarianism - a mindful approach to meat consumption with an emphasis on quality and lower frequency of consumption - was also more prevalent among women (8,6%) than men (2,1%).

Table 1 – Characterization of the study sample ($n = 233$).

Variable	Class	Frequencies	Percentage	
Gender[1]	Male	130	55,5	
	Female	103	44,1	
	Other	1	0,4	
		Total % (*n*)	**Male** % (*n*)	**Female** % (*n*)
Age[2]	**Young** *(18-34 years)*	40,0(71)	18,6(33)	21,4(38)
	Middle-Aged *(35-51 years)*	30,5(55)	17,5(32)	13(23)
	Older *(52-67 years)*	29,5(53)	18,5(33)	11(20)
	Mean [95%CI]	40,5[38,5; 42.6]	41,8[38,9; 44,6]	39,0[36,0; 42,1]
Education	**Low** *(Hauptschulabschluss/equal & Realschulabschluss/equal)*	12,9(30)	7,7(18)	5,2(12)
	Medium *(Fachhochschulreife/Abitur & Berufsausbildung/Lehre)*	38,6(90)	20,6(48)	18(42)
	High *(Bachelor & Master & PHD)*	48,5(113)	27,5(64)	21(49)
Income[3]	**Low** *(Up until 1.999€)*	19,9(39)	10,2(20)	9,7(19)
	Medium *(2.000€ – 5.999€)*	62,4(123)	38,6(76)	23,8(47)
	High *(6.000€ and more)*	17,7(35)	11,1(22)	6,6(13)
Region[4]	**North** *(Schleswig-Holstein, Hamburg, Bremen, Lower Saxony, Mecklenburg-Vorpommern)*	5,6(13)	4,3(10)	1,3(3)
	South *(Baden-Württemberg, Bavaria)*	69,6(160)	39,6(91)	30(69)
	East *(Berlin, Brandenburg, Saxony)*	6,1(14)	3(7)	3,1(7)
	West *(Nordrhein-Westfalen, Rhineland-Palatinate, Saarland, Hesse)*	18,7(43)	9,1(21)	9,6(22)
Diet	**Omnivores**	89,3(208)	53,7(125)	35,6(83)
	Flexitarian	10,7(25)	2,1(5)	8,6(20)
Red meat eater status	**Frequent**	86,3(201)	52,4(122)	33,9(79)
	Infrequent	13,7(32)	3,4(8)	10,3(24)

[1] *n*=233 for all analyses in this table except gender; gender=other considered as missing value.
[2] *n*=179; due to a technical fault, age was not collected for Prolific participants.
[3] *n*=197; 37 participants declined to disclose details about their income.
[4] *n*=231; 3 participants declined to disclose their region of residence.

3.4 Analysis

Data was analyzed using SPSS version 28. First, the reliabilities (Cronbach α) of psychometric measures of meat attachment and gender identity were computed and descriptive analyses of composite means, as well as of all other variables, performed. Given that the research hypotheses focused mainly on gender effects on meat consumption, descriptive statistics were computed separately by gender. Mean values and 95% confidence intervals were compared.

The presence of significant differences in red meat consumption in relation to gender identity was investigated with ANOVA. To better understand the influence of type of meat on the relationship between gender identity and meat consumption (Hypothesis 1), a Two-Step

Cluster Analysis was conducted. Two-Step Cluster Analysis has the advantage of being able to manage large data sets and identify natural groupings based on behavioral patterns, entering both categorical and continuous variables. This method carries out an initial pre-clustering of cases into numerous small clusters, followed by the aggregation of these into the optimal number of distinct clusters. The pattern of behavior of interest comprised the frequency of consumption of different types of meat. To determine the presence of distinctive meat consumption segments, cluster analysis was carried out on six meat products: beef steak, pork sausage and cold cuts, beef burger, pork schnitzel, chicken fillet and chicken nuggets. A medium quality clustering solution was obtained, identifying three clusters, as depicted in Figure 3.

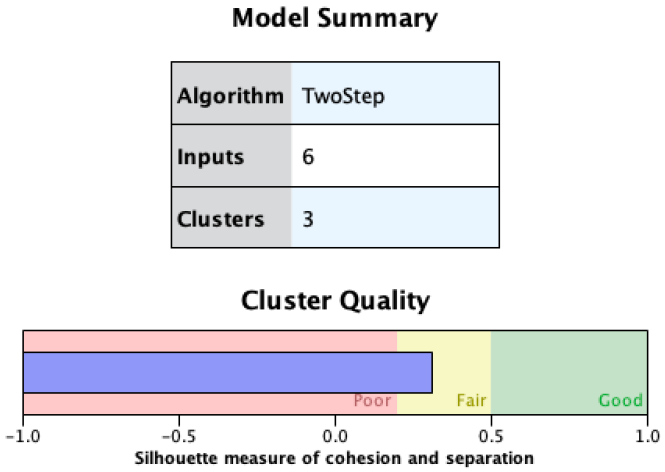


Figure 3 – Two-Step Cluster analysis: Model summary and cluster quality.

Significant differences in the means of all clustering variables were found between clusters using ANOVA. Since Levene's test values were significant at p= 0,05, the homogeneity of variances assumption were not met and non-parametric tests performed. Nonetheless, Kruskal-Wallis test statistics confirmed ANOVA results, indicating that the differences between clusters were significant for all clustering variables (see Appendix VII for details). To characterize the clusters and study Hypothesis 1, the mean of some demographics and gender identity were entered as dependent variables in both ANOVA and non-parametric tests with cluster membership as factor. Furthermore, ANOVA with gender and cluster membership as factors and means of the frequency of consumption of different types of meat, meat attachment, gender identity and intention to reduce red meat consumption as dependent variables were run to uncover any significant differences, complemented by non-parametric Kruskal-Wallis tests whenever ANOVA assumptions were not verified. Post-hoc multiple

comparison tests, including the Bonferroni method and Tamhane's T2, complemented the analysis.

Next, ANOVA with message treatment as factor and means of meat attachment, gender identity and intention to reduce red meat consumption as dependent variables were ran to test the potential effects of exposure to different messages, complemented by non-parametric Kruskal-Wallis tests whenever ANOVA assumptions were not met. No significant effects at $p < ,05$ were found. Post-hoc multiple comparison tests, including the Bonferroni method and Tamhane's T2, confirmed these results. Results of a simple linear regression entering meat attachment and gender identity scale means and type of message as predictors, and intention to reduce red meat consumption as regressor showed that only meat attachment means was a significant negative predictor at $p < ,05$.

Next, gender identity scale means was used to discretize participants into feminine *vs* masculine *vs* ambivalent identification groups. A General Linear Model was ran using this variable and type of message as factors, and intention to reduce red meat consumption as effect, with and without meat attachment means as a control variable. Results confirmed those obtained with simple regression, showing no significant main or interacting effects of treatment and TMF at $p < ,05$, except in the case of exposure to an informational message by the feminine-identified group. As type of message had no further significant main or interaction effects on the intention to reduce red meat consumption, the analysis was continued on data pooled across all experimental conditions. A series of simple linear regressions was finally conducted to investigate any potential mediation of meat attachment means on the effects of gender identity on intention to reduce red meat consumption.

CHAPTER IV RESULTS AND DISCUSSION

4.1 Meat eating behavior: Correlational effects of type of meat and gender

4.1.1 Descriptive statistics

Table 2 presents the descriptive statistics of meat consumption frequency per type of meat and gender.

Table 2 - Descriptive statistics of meat-eating frequency per meat type and gender (*n*=233).

		% (n)		
Type of meat	**Consumption frequency[1]**	**Total sample**	**Males**	**Females**
Beefsteak	Low	91,7(214)	50,1(117)	41,6(97)
	Medium	7,9(18)	5,2(12)	2,7(6)
	High	0,4(1)	0,4(1)	0(0)
	Mean [95%CI]	1,95[1,80; 2,10]	**2,17[1,97; 2,37]**	**1,67[1,46; 1,88]**
Pork sausage & cold cuts	Low	44,2(103)	19,7(46)	24,5(57)
	Medium	39,9(93)	24,4(57)	15,5(36)
	High	15,8(37)	11,6(27)	4,2(10)
	Mean [95%CI]	4,07[3,78; 4,36]	**4,56[4,18; 4,94]**	**3,45[3,02; 3,88]**
Chicken filet	Low	168,2(159)	36,9(86)	31,3(73)
	Medium	29,1(68)	16,3(38)	12,8(30)
	High	2,5(6)	2,5(6)	0(0)
	Mean [95%CI]	2,93[2,74; 3,13]	2,95[2,66; 3,23]	2,91[2,66; 3,17]
Beef burger	Low	88,8(207)	47,2(110)	41,6(97)
	Medium	10,8(26)	8,3(20)	2,5(6)
	High	0,4(1)	0,4(1)	0(0)
	Mean [95%CI]	2,16[2,00; 2,31]	**2,42[2,20; 2,65]**	**1,83[1,63; 2,02]**
Pork schnitzel	Low	90,7(211)	49,5(115)	41,2(96)
	Medium	8,9(21)	6(14)	2,9(7)
	High	0,4(1)	0,4(1)	0(0)
	Mean [95%CI]	1,97[1,83; 2,11]	**2,15[1,95; 2,34]**	**1,75[1,55; 1,95]**
Chicken nuggets	Low	93,2(217)	52(121)	41,2(96)
	Medium	5,6(13)	3,1(7)	2,5(6)
	High	1,2(3)	0,8(2)	0,4(1)
	Mean [95%CI]	1,85[1,70; 2,00]	**1,92[1,70; 2,13]**	**1,78 [1,57; 1,98]**

[1]*Low: 1=Not at all, 2=1 time in the last month, 3=2 times in the last month; Medium: 4=1 time per week, 5=2 times per week, 6=3-4 times per week; High: 7=5-6 times per week, 8=1 time per day, 9=several times per day*

4.1.2 Cluster Analysis Results

Three clusters were identified based on the patterns of consumption of different types of meat identified among respondents (see Figure 3). Cluster 1, the largest group, comprised 88 people (37,6%), followed by Cluster 2 with 79 people (33,8%) and Cluster 3, the smallest group, with 67 people (28,6%). Table 3 discriminates the meat-eating and socio-demographic characteristics of each cluster.

Table 3 – Profile of the three clusters of respondents identified according to their meat-eating patterns (*n*= 234). Different letters in row signal significant differences.

Meat Type	**Cluster 1** (*n*=88) Sausage/ Cold Cut Eaters	**Cluster 2** (*n*=79) Little/White Meat Eaters	**Cluster 3** (*n*=67) All Meat Eaters	**Z-Value (Post-hoc *p*-value)**
	Mean [95%CI]			
Beef Steak	1,56[1,41;1,71]	1,62[1,46;1,78]	2,84[2,47;3,20]	36,98(<,001)
Pork Sausage/ Cold Cuts	5,69[a][5,32;6,07]	2,19[b][1,92;2,46]	4,13[c][3,63;4,64]	88,33(<,001)
Chicken Filet	2,16[a][1,96;2,35]	2,62[b][2,34;2,90]	4,33[c][3,96;4,69]	64,62(<,001)
Beef Burger	1,82[a][1,65;1,99]	1,59[a][1,44;1,75]	3,28[b][2,95;3,61]	64,29(<,001)
Pork Schnitzel	2,26[a] [2,08;2,44]	1,18[b][1,09;1,26]	2,51[a][2,17;2,84]	43,89(<,001)
Chicken Nuggets	1,56[a][1,39;1,72]	1,62[a][1,42;1,82]	2,52[b][2,14;2,90]	17,78(<,001)
Other Variables	**Cluster 1** (*n*=88) Sausage/ Cold Cut Eaters	**Cluster 2** (*n*=79) Little/White Meat Eaters	**Cluster 3** (*n*=67) All Meat Eaters	**Z-Value (Post-hoc *p*-value)**
	Mean [95%CI]			
Gender Identity	4,67[a][4,18;5,16]	3,25[b][2,78; 3,71]	5,02[a][4,45; 5,59]	13,22(<,001)
Meat attachment	3,41[a] [3,27;3,64]	3,08[b][3,93;3,23]	3,53[a][3,38;3,68]	9,82(<,001)
Intention to reduce red meat consumption	1,94[a][1,72;2,17]	2,09[a][1,86; 2,32]	1,87[a][1,63;2,10]	0,93(,397)
Age	42,68[a][39,7;45,6]	41,54[a][37,7;45,4]	35,67[b][31,5;39,8]	3,94(,021)
Education	4,92[a][4,62;5,22]	5,63[b][5,31;5,95]	5,48[b][5,16;5,80]	5,99(,004)
Income	3,46[a][3,21;3,72]	3,52[a][3,18;3,86]	3,37[a][2,99;3,75]	0,23(,814)

Cluster 1, labelled "All meat eaters", demonstrated the highest consumption across almost all the meat categories listed: beef steak, chicken fillet, beef burgers, pork schnitzel and chicken nuggets. The only category in which this cluster exhibited the second highest consumption was pork sausage and cold cuts. Meanwhile, this category was consumed most often by Cluster 2, hence labeled as "Sausage or cold cuts eaters". While showing a relatively low frequency of consumption across all other meat categories, this cluster revealed a stronger habit of eating sausage and cold cuts (between 2 to 4 times a week). Cluster 3, the "Little/White Meat Eaters", consistently demonstrated a very low overall meat consumption across all categories, with a slight preference for white meat, such as chicken fillet.

Means of gender identity scores, level of education and age (but not of income level) differed significantly between clusters. Kruskal-Wallis test statistics confirmed these results (see Appendix VII). These results indicate that while gender identity and meat attachment vary with patterns of consumption of red/unprocessed *vs* white/processed meats, the intention to reduce the consumption of red meat does not. People with a traditional female gender identity and lower meat attachment tend to consume less meat and mainly white meat when they do eat meat, while people with a more masculine identity and higher meat attachment consume a

wider range of meat, with a specific preference for sausages and cold cuts. Furthermore, contrary to what was expected from the literature, the data revealed that women in this sample tended to consume less processed meats, favoring chicken fillets over chicken nuggets, while masculinity correlated with a stronger preference for red meat, which included a specific subgroup with a preference for pork sausages and cold cuts over other meats. In addition, age also appears to play a role: "All meat eaters" are significantly younger than respondents in the other two clusters. Finally, "Sausage and cold cut eaters" tend to have a lower level of education than the remainder.

4.2 Experimental Results: Assessing Meat Reduction Message Efficacy

4.2.1 Descriptive statistics

Table 4 depicts the mean [95%CI] of gender identity, meat attachment and intention to reduce red meat consumption per message-treatment group and for the total sample. The results show that there were no significant mean differences across groups for any of the three variables.

Table 4 - Descriptive of dependent variables per message treatment (*n*=234).

	Mean [95%CI]			
	Informational (*n*=81)	**Emotional** (*n*=79)	**Dynamic Norms** (*n*=74)	**Total** (*n*=234)
Gender Identity (TMF)[2]	4,23[3,69;4,77]	4,57[4,04;5,10]	4,29[3,99;4,59]	4,10[3,57;4,62]
Meat attachment[1]	3,34[3,19;3,49]	3,36[3,21;3,52]	3,33[3,25;3,42]	3,30[3,15;3,45]
Intention to reduce red meat consumption	1,99[1,76;2,21]	1,85[1,62;2,08]	1,97[1,82;2,10]	2,06[1,83;2,29]

Nonetheless, when pooling all data across treatment groups, all three variables were significantly correlated with each other. Indeed, means of gender identity and meat attachment were both significantly ($p < ,001$) negatively associated to intention to reduce red meat consumption (Spearman's $rho_{234} = -0,212$; Spearman's $rho_{234} = -0,491$, respectively). Meanwhile, both these variables were significantly ($p < ,001$) positively associated with each other (Spearman's $rho_{234} = 0,330$). These finding indicate that individuals who identify strongly with traditional male gender identities are less likely to reduce red meat consumption than the remainder. On the other hand, the former also exhibit a significantly higher level of meat attachment than the later. These findings are in line with the assumptions made in this thesis and the previous findings of the literature discussed in Chapter II.

Table 5 shows the descriptive statistics of meat attachment, intention to reduce red meat consumption and gender identity, for the total sample and per gender, pooling the collected data across the three message-treatment groups.

Table 5 - Descriptive statistics of dependent variables and gender identity (*n*=233).

		% (*n*)		
Variable		**Total sample** 100% (234)	**Males** 55,6% (130)	**Females** 44,0% (103)
Gender Identity (TMF)[1]	**Mean [95%CI]**	4,29[3,99;4,59]	**6,27[6,14;6,41]**	**1,80[1,63;1,96]**
Meat attachment[2]	**Mean [95%CI]**	3,34[3,25;3,42]	**3,50[3,39;3,61]**	**3,13[3,00;3,26]**
Intention to reduce red meat consumption[3] % (n)	Not at all (1)	43,4(101)	27,9(65)	15,5(36)
	Marginally (2)	25,4(59)	14,2(33)	11,2(26)
	Somewhat (3)	24(56)	11,6(27)	12,4(29)
	Strongly (4)	6,3(15)	2,1(5)	4,2(10)
	Very Strong (5)	0,9(2)	0(0)	0,9(2)
	Mean [95%CI]	1,96[1,83;2,09]	**1,78[1,63;1,94]**	**2,18[1,97;2,40]**

[1] α = 0,974; 1=Femininity; 7=Masculinity; [2] α=0,903; [3]1= Strongly disagree; 5=Strongly agree.

Firstly, these results show that, as could be expected, gender identity highly discriminated respondents in accordance with the gender they reported to identify with at the start of the survey. Secondly, they lend support to the hypothesis that the relevant differences in frequency of meat consumption per type of meat and gender earlier found are likely related to the significant differences in the level of meat involvement observed between men and women in this study. Moreover, albeit the intention to reduce red meat eating was generally low across respondents, there were still important differences in this variable between men and women, with the former showing an even lower intention to reduce their current consumption than the latter. Indeed, almost half of the respondents declared to have no intention of reducing their red meat consumption, while around a quarter intend to reduce it only slightly or somewhat. This is not entirely surprising given the already relatively low general meat consumption reported by participants at the start of the study. However, it is interesting that women or female gender identities, who already consume less meat overall and significantly less red meat than men or male gender identities, nevertheless show a significantly higher intention to further reduce their meat consumption compared to men or male gender identities.

4.2.2 General Linear Model Results

Appendix VIII presents the results of a general linear model entering message treatment and discretized mean TMF ratings (Femininity=83; Masculinity=108; Ambivalent=49) as factors,

means of meat attachment as co-variate and intention to reduce meat consumption as predictor. This analysis was run to provide a test for the hypothesis that gender identity moderated the impacts of different messages on intention to reduce red meat consumption directly, without the mediation of meat attachment.

The global model results show that message type effects, alone or in interaction with gender identification groups, do not significantly affect intention to reduce red meat consumption. However, model marginal mean estimates reveal a significant difference in intention to reduce meat consumption between feminine- and masculine gender identities when respondents were exposed to the informational message (Mean $\text{Intention}_{\text{femininity}}$ = 2,28 [1,96; 2,59]; Mean $\text{Intention}_{\text{Masculinity}}$ = 1,82 [1,52; 2,13], p = 0,044) that does not replicate in the other two types of messages. Moreover, for the TMF class "femininity", respondents exposed to the informational message exhibited a significantly higher intention to reduce meat consumption that those exposed to the dynamic norms message (Mean $\text{Intention}_{\text{Information}}$ = 2,28 [1,96; 2,59]; Mean $\text{Intention}_{\text{Norms}}$ = 1,82 [1,44; 2,02], p = 0,068). These differences are depicted in Figure 4.

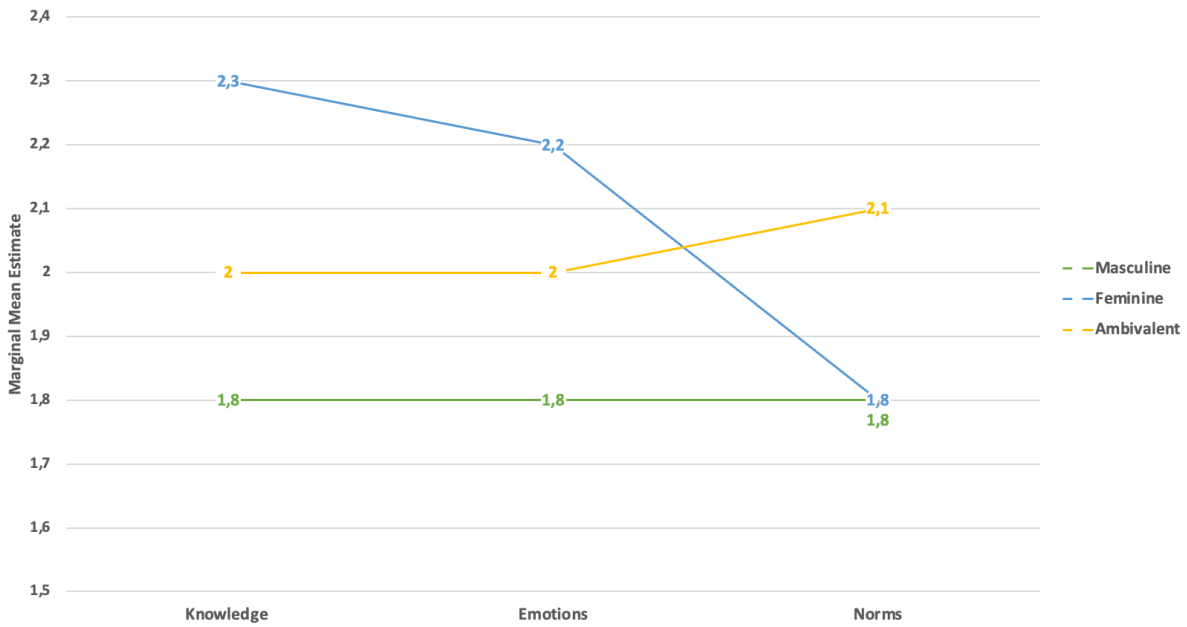


Figure 4 – Estimated marginal means of intention to reduce red meat consumption as a function of type of message and gender identity class.

These findings suggest that information-based messages could have a significantly greater effect on individuals who identify with a feminine gender identity compared to dynamic norm-oriented messages. For those individuals identifying with a feminine gender identity,

exposure to information-based messages significantly increased their intention to reduce red meat consumption compared to messages based on dynamic norms. For those identifying with a masculine or ambivalent gender identities, none of the three messages were found to have a significant impact on their intention to reduce red meat consumption. These results thus partly support Hypotheses 2 and 2a.

4.3 Meat attachment: the missing link between gender identity and intention to reduce red meat consumption?

Overall, the results obtained indicate that there is a significant correlation between the level of meat attachment and gender, gender identity, meat consumption behavior and the intention to reduce the consumption of red meat. Moreover, these associations point towards the directions hypothesized based on the results from previous research reviewed in Chapter II. Pooling the data across message-treatment groups, given that this condition did not seem to have an overall significant effect on meat attachment level, the hypothesis that the later construct was a mediator of the effects of gender identity on the intention to reduce red meat eating was explored with simple linear regression analysis. Figure 5 illustrates the process model proposed.

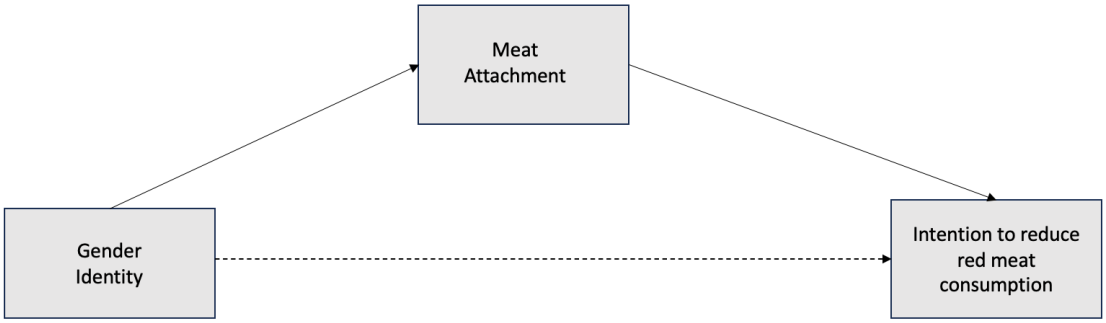


Figure 5 – Hypothesized process model explaining the association between gender identity and intention to eat less red meat in the medium term through the mediation of meat attachment.

The results of a series of simple linear regressions testing the relationships depicted in this model are summarized in the Table 6. These emphasize that meat attachment is a strong predictor of the intention to reduce red meat consumption. Indeed, an increase in meat attachment level significantly lowers the likelihood of reducing red meat consumption.

Table 6 – Results of simple linear regressions testing whether mean level of meat attachment mediate the effect of gender identity on intention to reduce red meat consumption (*n*=234).

	Z (*p*-value)	Adj R^2	β	t-test (*p*-value)
Regressor = Meat attachment				
Regression 1 Predictor = Gender Identity	24,49(<,001)	0,092	0,31	4,949(<,001)
Regressor = Intention to reduce red meat eating				
Regression 2 Predictor = Gender Identity	13,28(<,001)	0,050	-0,23	-3,645(<,001)
Regression 3 Predictor = Meat Attachment	71,95(<,001)	0,233	-0,49	-8,482(<,001)
Regression 4 Predictors = Gender Identity and Meat Attachment	37,32(<,001)	0,238	Gender identity =-0,09 Meat attachment =-0,46	Gender identity =-1,514(0,131) Meat attachment =-0,7622(<,001)

However, when analyzing whether gender identity and meat attachment simultaneously predict the intention to reduce red meat consumption, only meat attachment holds a statistically significant predictive association. This leads to conclude for the existence of a process of mediation in which meat attachment varies with gender identity, thereby leading to changes in the intention to reduce red meat consumption. Essentially, an individual's identification with a traditional male gender identity increases attachment to meat, which in turn decreases the willingness to reduce red meat consumption. Thus, it is not directly male or female gender identity that is the crucial determinant of the intention to reduce red meat consumption. Gender identity seems to have actually little to no direct influence on the intention to reduce red meat consumption when meat attachment level is considered.

4.4 Discussion

Overall, this study showed that information-based messages had a significant impact on women's intentions to reduce red meat consumption, but not on men's intentions. Emotional and normative messages had no significant influence, and no gender differences were found in this regard. In line with previous research, it was found that people who identify with a traditional male gender identity consume more meat, especially red meat, whilst also being more meat attached than their female counterparts. Another important discovery was that gender identity has no direct influence on the intention to reduce red meat consumption but is mediated by the degree of meat attachment. This provides important insights into the gender-specific mechanisms of meat consumption and strategies to reduce it.

RQ1: Does gender identity influence the consumption of different types of meat amongst German men and women?

Results showed clear gender-specific differences in the consumption of red meat among German men and women, while no such differences were recognizable in the consumption of white meat. This indicates that gender identity plays a critical role in meat consumption behavior, but that this influence depends, among other things, on the type of meat in question. People with a traditional female gender identity tend to consume less meat and mainly white meat when they do eat meat, while individuals with a more masculine identity consume a wider range of different types of meat, with a specific preference for sausages and cold cuts. Another key finding is that gender identity has a direct influence on meat attachment, but not necessarily on the intention to reduce meat consumption. Men and individuals who identify with a traditional male gender identity show a stronger attachment to meat. This attachment in turn has a direct impact on their intention to reduce meat consumption.
People with a stronger attachment to meat tend to show less willingness to reduce their meat consumption, which in turn leads to higher meat consumption. Therefore, men who typically show higher levels of meat attachment are less likely to reduce their meat consumption. Not only does this support Hypothesis 1, stating that meat consumption is higher among individuals holding more traditional masculine gender identities, but it also suggests that their meat consumption is likely to remain high. It appears to be more difficult to persuade these individuals to reduce their meat consumption, as their willingness to do so is inhibited by their stronger attachment to meat. This finding makes a crucial contribution to understanding the dynamics of gender identity and dietary behavior and shows that traditional masculine gender roles correlate not only with higher meat consumption, but also with a lower tendency to change these consumption patterns.

RQ2: How does gender identity affect the response to messages encouraging reduced meat consumption among German men and women?

Results showed that the information-based message, which was intended to stimulate the intention to reduce the consumption of red meat, had a significant effect on people who self-identify with a traditionally female gender identity. Such an effect could not be confirmed for people identifying with a traditional male gender identity. This result does not replicate to the other message types, in particular the dynamic social norms message. This suggests an effect of gender identity on intention to reduce red meat consumption that could be to some extent affected by the type of message. In line with this, the emotional and dynamic norm messages showed no effect on either male-identifying or female-identifying individuals. This pattern demonstrates the complexity of message effectiveness in influencing meat reduction

intentions and highlights that their effects are nuanced and may vary considerably between gender identity groups.

The lack of effectiveness of the messages included in this study calls for an investigation into the potential causes. One possibility, particularly with regard to the male-identifying individuals, could be that the messages may have been too generic and not sufficiently gender-specific. It seems that while such generic messages have a potential impact on women - who, as the data from the literature presented in Chapter II suggests, may be more receptive to messages about health benefits - appear to have little or no effect on men. Another potential cause could have been that participants already reported a low intake of red meat, leading them to have no further reduction intentions. However, this contrasts with the data obtained from the general question on red meat consumption, which showed that 89,3% of participants reported frequent consumption of pork or beef (see Table 1, Chapter 3.3). Still, when questioned on a more specific consumption of certain types of meat, such as sausages and beef steaks, in the past month, the reported consumption rates were significantly lower.

This suggests that participants may have self-reported as more conscious meat consumers than was actually the case. This is possibly due to the fact that they may actually be aware of the negative effects of meat consumption and are consciously or unconsciously trying to minimize the cognitive dissonance arising from this 'meat paradox' mentioned in Chapter II by reporting a reduced consumption of meat.

Another reason for the observed discrepancies could be that respondents had difficulty remembering specific types of meat they had eaten in the last month when asked, or that the types of meat mentioned did not correspond to the participants' usual consumption. To summarize, gender identity appears to have an influence on the receptivity of messages that aim to reduce red meat consumption. Since only the information-based messages showed a positive influence on female-identifying individuals, but none of the messages had an effect on male-identifying individuals, no definite statement can yet be made on how gender identity influences the response to messages encouraging reduced meat consumption.

CHAPTER V: CONCLUSION AND LIMITATIONS

5.1. Main Conclusion & Managerial Implications

The significant role of global meat consumption in contributing to climate change is undeniable (de Boer et al., 2013; Gerber et al., 2013; IPCC, 2019). Additionally, the consumption of large amounts of red and processed meat is associated with serious health risks, including heart disease, diabetes, and obesity (IARC, 2015; Wang et al., 2015; WHO, 2023). Despite these widely recognized negative effects, global meat consumption continues to rise and is expected to reach a new peak of 364 million tons this year (FAO, 2023). To achieve the goals of the Paris Agreement and the UN Sustainable Development Goals, it is essential to drastically reduce global meat consumption (IPCC, 2019; UN, 2019). The urgency to rethink and reduce meat consumption worldwide is therefore more pressing than ever. Fortunately, progress has been achieved in this respect in Germany. Meat consumption fell to a record low in 2022 (BMEL, 2022). However, these figures are still 136% above the recommended limits of the EAT-Lancet Commission, which emphasizes the urgent need to continue working intensively on meat reduction in Germany.

The existing literature in this area and the results of this study point to clear gender-specific differences in meat consumption behavior. In particular, men and individuals who identify with traditional male gender roles consume more meat, especially red meat. They also show a stronger attachment to meat and display little to no interest in reducing their meat consumption (De Backer et al.,, 2020; Ruby & Heine, 2011; Stanley et al., 2023; Tuohy, 2021; Rosenfeld & Tomiyama, 202; Rothgerber 2013). Therefore, effectively targeting this demographic is critical to achieving the necessary, substantive reductions in meat consumption. In this context, the present study exposed the central role that meat attachment plays on the intention to reduce meat consumption and the association of meat attachment with gender identity. Specifically, men show stronger meat attachment levels than women. Consequently, effective strategies to reduce meat consumption should focus on addressing and effectively reducing this attachment, particularly in men.

Traditional messaging strategies aimed at reducing meat consumption discussed in literature and employed within this study showed to limited effect. Only the exposure to information-based messages had an effect on female-identifying individuals, but not on male-identifying or more ambivalent individuals. Emotional or social dynamic norms messages exhibited no effect on the intention to reduce red meat consumption. These results indicate that generalized information messages may have a stronger effect on women than on men. This may be due to

the fact that women are more health conscious and more receptive to messages concerning health benefits than men. In addition, the results of this study show that women have a significantly lower level of meat attachment than men, which lowers the inhibition threshold regarding the willingness to reduce their meat consumption and makes it easier to be activated by messages. The lack of effect on men in this case points towards the necessity of making the messages less general and far more gender-specific and direct than was the case in this study. Future messages will potentially need to be bolder, more targeted, and overall gender specific. In light of the existing literature and the findings of this study, it seems necessary for future messaging approaches to clearly focus on the male target group and directly challenge the deep-rooted link between masculinity and meat consumption discussed in Chapter 2.3. Considering these findings, the main recommendation to management and marketing in the meat alternatives sector, or any other sector seeking to promote a meat-free or meat-reduced diet, would be to develop gender-specific campaigns targeting the male audience. These campaigns should boldly confront the long-standing cultural norm that associates meat consumption with masculinity in Western societies and aim to disrupt this norm. This strategy goes beyond simply promoting alternatives and aims to change societal attitudes towards meat consumption and masculinity. Another strategic approach could be, amongst others, the implementation of educational initiatives from an early age on. Educating children about nutrition and challenging gendered food stereotypes can lay the foundations for wider cultural change. Such an approach can help to normalize reduced meat consumption in different segments of society and separate it from gender identity.

To summarize, the problem of high meat consumption worldwide can only be tackled with a multi-faceted strategy. It is about more than just sharing information; it is about understanding and addressing the cultural and social factors that shape dietary habits. By focusing on the factors that favor high meat consumption, particularly among men, there is an opportunity to make significant progress towards a healthier and more sustainable future.

5.2. Limitations and Implications for Future Research

This dissertation explored the relationship between gender identity and meat consumption with the aim of providing insights for the development of effective communication and marketing strategies that would encourage a reduction in meat consumption. Despite a thorough literature review, lengthy and detailed preparation and execution of the study, and thorough data analysis, it still had a number of limitations that need to be addressed and may guide future research.

Firstly, the sample may have lacked representativeness. Participants were predominantly from the southern regions of Germany, with a general tendency towards middle income and higher educational backgrounds. This imbalance in demographics suggests that future research should aim for a more geographically and socioeconomically diverse sample to ensure a broader representation of different regions in Germany with different income levels and educational backgrounds.

A further limitation emerged regarding the effectiveness of the meat consumption section of the survey instrument. The observed discrepancies between the responses to the questions on general red meat consumption and the specific consumption of different types of meat over the past month suggest possible problems with recall accuracy or under-reporting by participants. These assumptions are speculative but emphasize the need to refine the methodology for measuring self-reported meat consumption in future studies.

Finally, the study uncovered only a limited impact of meat reduction messages, as only an effect on the intention to reduce the consumption of red meat through information-based messages could be observed, and only for feminine-identified individuals. Still, the study's investigation of meat-reducing messages revealed an interesting dynamic. While the messages themselves did not show a significant effect on meat reduction behavior, the analysis confirmed a key aspect of the hypothesized theoretical framework. The hypothesized mechanism that influences a person's meat attachment is crucial to their intention to reduce meat consumption has been confirmed. Furthermore, according to this model, it can be assumed that gender identity has a direct influence on meat attachment, which in turn influences the intention to reduce meat consumption. This finding suggests that the messages used in this study, although not effective in their current form, were conceptually on the right track. It is likely that they were too subtle and not sufficiently targeted towards gender. Therefore, future research should focus on developing and testing bolder, and more gender-specific messages.

APPENDIX

APPENDIX I - Survey Messages

In German

Message 1: Informational

Die industrielle Fleischproduktion ist eine der schwerwiegenderen Faktoren, die den Klimawandel vorantreiben. Da sie zu einem Anstieg der Treibhausgase, einem hohen Wasserverbrauch, einer Destabilisierung des Stickstoffkreislaufs, einem hohen Verbrauch von Biomasse und dem Verlust der biologischen Vielfalt beiträgt, sowie eine der größten Emissionsquelle für Methan darstellt. Nach Angaben der Weltgesundheitsorganisation wird ein hoher Konsum von rotem und verarbeitetem Fleisch mit einem erhöhten Risiko für Herz-Kreislauf-Erkrankungen, Typ-2-Diabetes und Fettleibigkeit in Verbindung gebracht und ist zudem, mit hoher Wahrscheinlichkeit krebserregend für Menschen.

Message 2: Emotional

Tiere haben wie Menschen unterschiedliche Persönlichkeiten mit unterschiedlichen Charaktereigenschaften und emotionalen Fähigkeiten, die über das instinktive Verhalten hinausgehen. So zeigen beispielsweise Kühe in ihren Aktionen und Reaktionen auf die Welt um sie herum ein hohes Maß an Individualität. Ihre Persönlichkeiten können schüchtern oder mutig sein, die gehen enge Bindungen mit anderen Kühen in ihrer Gruppe ein und können dabei auch nachtragend sein. Und sie zeigen Freude am Lösen von Problemen, z. B. beim Durchqueren eines komplexen Labyrinths auf der Suche nach Futter.

Message 3: Dynamic Norms

Die Deutschen reduzieren derzeit ihren Fleischkonsum.
Das Bundesinformationszentrum für Landwirtschaft berichtet, dass die Deutschen im Jahr 2022 pro Person 4,2 Kilogramm weniger Fleisch gegessen haben als noch im Jahr 2021. Dies markiert den niedrigsten Stand des Fleischkonsums in Deutschland seit Beginn der Verbrauchsberechnungen im Jahr 1989.

Links to original presentation of messages: Message 1 | Message 2 | Message 3

In English

Message 1: Informational

Industrial meat production is one of the more serious drivers of climate change. As it contributes to an increase in greenhouse gases, high water consumption, destabilisation of the nitrogen cycle, high consumption of biomass and loss of biodiversity, as well as being one of the largest sources of methane emissions. According to the World Health Organisation, high consumption of red and processed meat is associated with an increased risk of cardiovascular disease, type 2 diabetes and obesity and is also highly likely to be carcinogenic to humans.

Message 2: Emotional

Like humans, animals have different personalities with different character traits and emotional abilities that go beyond instinctive behaviour. Cows, for example, show a high degree of individuality in their actions and reactions to the world around them. Their personalities can be shy or courageous, they form close bonds with other cows in their group and can also be resentful. And they enjoy solving problems, such as traversing a complex maze in search of food.

Message 3: Dynamic Norms

Germans are currently reducing their meat consumption.

The Federal Information Centre for Agriculture reports that Germans ate 4.2 kilograms less meat per person in 2022 than in 2021. This marks the lowest level of meat consumption in Germany since consumption calculations began in 1989.

Appendix II – Survey Instrument

Start of Block: Introduction

Introduction Liebe Teilnehmerin, lieber Teilnehmer,

vielen Dank, dass Sie an dieser Umfrage teilnehmen, die ein wichtiger Bestandteil meiner Masterarbeit ist.

Diese Umfrage untersucht, wie wir in Deutschland Fleisch konsumieren und sollte nicht mehr als 8 Minuten Ihrer Zeit in Anspruch nehmen.

Bitte seien Sie versichert, dass der Schutz Ihrer Privatsphäre dabei unter allen Umständen gewahrt wird. Alle in dieser Umfrage erhobenen Daten werden streng vertraulich behandelt und lassen sich nicht auf Sie als Person zurückführen. Ihre Antworten werden anonymisiert und ausschließlich für wissenschaftliche Zwecke verwendet.

Ich bitte Sie um eine ehrliche und aufmerksame Beantwortung der folgenden Fragen , um die Qualität und Integrität dieser Untersuchung zu gewährleisten.

Vielen Dank für Ihren Beitrag zu dieser Studie!

End of Block: Introduction

Start of Block: German

German Sind Sie deutscher Staatsbürger oder leben Sie seit mehr als 10 Jahren in Deutschland?

- ○ Ja (1)
- ○ Nein (2)

End of Block: German

Start of Block: Age

Age Wie alt sind Sie?

▼ 17 oder jünger (17) ... 68 oder älter (68)

End of Block: Age

Start of Block: Diet

Diet Welche der folgenden Angaben beschreiben Ihre derzeitige Ernährung am besten?

- ○ Omnivor (keine besonderen Ernährungseinschränkungen) (1)
- ○ Vegetarisch (Kein Konsum von Fleisch, jedoch Verzehr von anderen tierischen Produkten) (2)
- ○ Vegan (Kein Konsum von tierischen Produkten) (3)
- ○ Pesketarisch (Konsumieren von Fisch, Kein Konsum von Fleisch) (4)
- ○ Flexitarisch (überwiegend vegetarische Ernährung, ab und an Konsum von hochwertigem, biologischem Fleisch) (5)

End of Block: Diet

Start of Block: Red Meat

Red Meat Essen Sie mehrmals in der Woche Rind oder Schwein? (Bitte denken Sie auch an Wurst, Aufschnitt, Hack etc.)

- ○ Ja (1)
- ○ Nein (2)

End of Block: Red Meat

Start of Block: Meat consumption frequency

Meat consumption: Wie oft haben Sie im letzten Monat die folgenden Fleischsorten gegessen?

	Gar nicht (1)	1 mal im letzten Monat (2)	2-3 mal im letzten Monat (3)	1 mal pro Woche (4)	2 mal pro Woche (5)	3-4 mal pro Woche (6)	5-6 mal pro Woche (7)	1 mal am Tag (8)	2 oder mehrmals am Tag (9)
Rinder-Steak (1)	○	○	○	○	○	○	○	○	○
Würstchen/Wurst (Schwein) (2)	○	○	○	○	○	○	○	○	○
Hühnerfilet (3)	○	○	○	○	○	○	○	○	○
Rindfleisch-Hamburger (4)	○	○	○	○	○	○	○	○	○
Schweineschnitzel (5)	○	○	○	○	○	○	○	○	○
Hähnchen Nuggets (6)	○	○	○	○	○	○	○	○	○

End of Block: Meat consumption frequency

Start of Block: Condition 1: Message 1 (Knowledge)

Message 1 Sie werden nun eine kurze Prävention in Form eines Videos sehen. Bitte folgen Sie dieser aufmerksam und beantworten Sie die darauffolgende Frage.

End of Block: Condition 1: Message 1 (Knowledge)

Start of Block: Condition 2: Message 2 (Emotion)

Emotion Sie werden nun eine kurze Präsentation in Form eines Videos sehen. Bitte folgen Sie dieser aufmerksam und beantworten Sie die darauffolgende Frage.

End of Block: Condition 2: Message 2 (Emotion)

Start of Block: Condition 3: Message 3 (Dynamic Norms)

Dynamic Norms Sie werden nun eine kurze Präsentation in Form eines Videos sehen. Bitte folgen Sie dieser aufmerksam und beantworten Sie die darauffolgende Frage.

End of Block: Condition 3: Message 3 (Dynamic Norms)

Start of Block: Post-Message Attention Control

Attention Control Wurde in der vorherigen Präsentation über den Eurovision Song Contest 2023 gesprochen?

- ○ Ja (1)
- ○ Nein (2)

End of Block: Post-Message Attention Control

Start of Block: Consumption Reduction Intention

X→

Reduction Intention Bitte geben Sie an, inwieweit Sie planen, Ihren Konsum von rotem Fleisch in den kommenden sechs Monaten zu reduzieren.

- ○ Überhaupt nicht (1)
- ○ Geringfügig (2)
- ○ Etwas (3)
- ○ Stark (4)
- ○ Sehr Stark (5)

End of Block: Consumption Reduction Intention

Start of Block: Meat attachement

Meat attachement 1 Bitte geben Sie an, wie sehr Sie den folgenden Aussagen zustimmen.

	Stimme überhaupt nicht zu (1)	Stimme nicht zu (2)	Stimme weder zu noch lehne ich ab (3)	Stimme zu (4)	Stimme voll und ganz zu (5)
Fleisch ist in meiner Ernährung unersetzlich. (16)	○	○	○	○	○
Bezüglich unserer Stellung in der Nahrungskette, haben wir das Recht Fleisch zu essen. (9)	○	○	○	○	○
Ich kann mir ein Leben ohne regelmäßigen Fleischkonsum nicht vorstellen. (11)	○	○	○	○	○
Ich würde mich gut fühlen mit einer fleischlosen Ernährung. (13)	○	○	○	○	○
Wenn ich gezwungen wäre, kein Fleisch mehr zu essen, würde ich mich traurig fühlen. (15)	○	○	○	○	○
Wenn ich kein Fleisch essen könnte, würde ich mich schwach fühlen. (12)	○	○	○	○	○
Fleisch zu essen, ist eine natürliche und unstrittige Praxis. (10)	○	○	○	○	○

Meat attachement 2 Bitte geben Sie an, wie sehr Sie den folgenden Aussagen zustimmen.

	Stimme überhaupt nicht zu (1)	Stimme nicht zu (2)	Stimme weder zu noch lehne ich ab (3)	Stimme zu (4)	Stimme voll und ganz zu (5)
Ich bin ein großer Fan von Fleisch. (3)	○	○	○	○	○
Ein gutes Steak ist unvergleichlich. (4)	○	○	○	○	○
Ich liebe Mahlzeiten mit Fleisch. (1)	○	○	○	○	○
Fleisch zu essen ist eine der größten Freuden in meinem Leben. (2)	○	○	○	○	○
Beim Essen von Fleisch werde ich an den Tod und das Leid der Tiere erinnert. (5)	○	○	○	○	○
Fleisch erinnert mich an Krankheiten. (7)	○	○	○	○	○
Fleisch zu essen ist ein nicht in Frage zu stellendes Recht jeder Person. (8)	○	○	○	○	○
Fleisch zu essen ist nicht respektvoll gegenüber dem Leben allgemein und der Umwelt. (6)	○	○	○	○	○
Bitte wählen Sie, im Rahmen einer Qualitätskontrolle, "Stimme überhaupt nicht zu" aus. (14)	○	○	○	○	○

Skip To: End of Survey If Bitte geben Sie an, wie sehr Sie den folgenden Aussagen zustimmen. != Bitte wählen Sie, im Rahmen einer Qualitätskontrolle, "Stimme überhaupt nicht zu" aus. [Stimme überhaupt nicht zu]

End of Block: Meat attachement

Start of Block: TMF

TMF1.1 Bitte beantworten Sie die folgenden Aussagen indem Sie den Schieber auf dem Balken Ihrer Meinung entsprechend verschieben.

Weiblich **Männlich**

Ich empfinde mich selbst als… ()	

TMF1.2 Bitte beantworten Sie die folgenden Aussagen indem Sie den Schieber auf dem Balken Ihrer Meinung entsprechend verschieben.

Weiblich **Männlich**

Idealerweise wäre ich gern... ()	

TMF 1.3 Bitte beantworten Sie die folgenden Aussagen indem Sie den Schieber auf dem Balken Ihrer Meinung entsprechend verschieben.

Weiblich **Männlich**

Traditionellerweise würden meine Interessen angesehen werden als... ()	

TMF 1.4 Bitte beantworten Sie die folgenden Aussagen indem Sie den Schieber auf dem Balken Ihrer Meinung entsprechend verschieben.

Weiblich **Männlich**

Traditionellerweise würden meine Einstellungen und Ansichten angesehen werden als... ()	

TMF 1.5 Bitte beantworten Sie die folgenden Aussagen indem Sie den Schieber auf dem Balken Ihrer Meinung entsprechend verschieben.

Weiblich **Männlich**

Aus Qualitätskontrollgründen, bitte bewegen Sie den Schieber auf den Balken nach ganz rechts. ()	

TMF 1.6 Bitte beantworten Sie die folgenden Aussagen indem Sie den Schieber auf dem Balken Ihrer Meinung entsprechend verschieben.

Weiblich **Männlich**

Traditionellerweise würde mein Verhalten angesehen werden als... ()	

TMF 1.7 Bitte beantworten Sie die folgenden Aussagen indem Sie den Schieber auf dem Balken Ihrer Meinung entsprechend verschieben.

	Weiblich	Männlich
Traditionellerweise würde meine äußere Erscheinung angesehen werden als... ()		

End of Block: TMF

Start of Block: Demographics

Gender Geben Sie bitte an mit welchem der folgenden Geschlechter Sie sich identifizieren.

- ○ Männlich (1)
- ○ Weiblich (2)
- ○ Transgender (3)
- ○ Nicht-binär / Nicht-konform (4)
- ○ Andere (bitte geben Sie dies an, wenn möglich) (5)

_____

Page Break

Education Bitte geben Sie den höchsten Bildungsgrad an den Sie bis dato erreicht haben.

▼ Keinen Schulabschluss (1) ... Promotion / Doktor oder höherer akademischer Grad (8)

Page Break

Region In welchem Bundesland in Deutschland leben Sie?
▼ Baden-Württemberg (1) ... Keine Angabe (99)

Page Break

Income In welche der folgenden Einkommensspannen fällt das Gesamteinkommen Ihres Haushalts pro Monat nach Abzug von Steuern und Sozialabgaben (Netto)?

- ○ Unter 1.000 Euro (1)
- ○ 1.000 bis 1.999 Euro (2)
- ○ 2.000 bis 3.999 Euro (3)
- ○ 4.000 bis 5.999 Euro (4)
- ○ 6.000 bis 7.999 Euro (5)
- ○ 8.000 Euro oder mehr (6)
- ○ Keine Angabe (99)

End of Block: Demographics

Standard: Introduction (1 Question)
Standard: German (1 Question)

Branch: New Branch
If
If Sind Sie deutscher Staatsbürger oder leben Sie seit mehr als 10 Jahren in Deutschland? Nein Is Selected

EndSurvey: Advanced

Standard: Age (1 Question)

Branch: New Branch
If
If Wie alt sind Sie? 17 oder jünger Is Selected
Or Wie alt sind Sie? 68 oder älter Is Selected

EndSurvey: Advanced

Standard: Diet (1 Question)

Branch: New Branch
If
If Welche der folgenden Angaben beschreiben Ihre derzeitige Ernährung am besten? Vegetarisch (Kein Konsum von Fleisch, jedoch Verzehr von anderen tierischen Produkten) Is Selected
Or Welche der folgenden Angaben beschreiben Ihre derzeitige Ernährung am besten? Vegan (Kein Konsum von tierischen Produkten) Is Selected
Or Welche der folgenden Angaben beschreiben Ihre derzeitige Ernährung am besten? Pesketarisch (Konsumieren von Fisch, Kein Konsum von Fleisch) Is Selected

EndSurvey: Advanced

Standard: Red Meat (1 Question)
Standard: Meat consumption frequency (1 Question)

BlockRandomizer: 1 - Evenly Present Elements

Block: Condition 1: Message 1 (Knowledge) (1 Question)
Block: Condition 2: Message 2 (Emotion) (1 Question)
Block: Condition 3: Message 3 (Dynamic Norms) (1 Question)

Standard: Post-Message Attention Control (1 Question)

Branch: New Branch
If
If Wurde in der vorherigen Präsentation über den Eurovision Song Contest 2023 gesprochen? Ja Is Selected

EndSurvey: Advanced

Standard: Consumption Reduction Intention (1 Question)
Block: Meat attachement (2 Questions)
Standard: TMF (7 Questions)
Standard: Demographics (4 Questions)

EndSurvey: Advanced

Page Break

Appendix III - Survey Measures

Variable	Survey Measure
Dependent Variable	
Meat consumption (all meats)	Q: How often have you eaten the following types of meat in the last month? A: Evaluation of six different types of meat: beef steak, sausage/sausage (pork), chicken fillet, beef burger, pork schnitzel, chicken nuggets along a 9-Point Likert Scale: 1=Not at all, 2=1 time in the last month, 3=2 times in the last month, 4=1 time per week, 5=2 times per week, 6=3-4 times per week, 7=5-6 times per week, 8=1 time per day, 9=several times per day
Meat reduction intention (De Backer et al., 2020)	Q: Please indicate to what extent you plan to reduce your consumption of red meat in the next six months. A: 5-Point Likert Scale: 1=Not at all, 2=Slightly, 3=Somewhat, 4=Strongly, 5=Very strongly
Independent Variable	
Meat attachment (Graça et al., 2015)	Validated German version (Kühn et al., 2023) 16 items, rated in 5-point Likert scale: 1= Strongly dagree, 2=Disagree, 3=Neither agree nor disagree, 4=Agree, 5=Strongly agree
Gender identity: The Traditional Masculinity-Femininity Scale (TMF) (Kachel et al., 2016)	Validated German version (Kachel et al., 2016) 7 items (see Appendix 1.1), rated on a 7-point scale (no values were shown to participants) ranging from 1=Female 7=Male
Demographics	**Gender** Q: Please indicate which of the following genders you identify with. A: Female / Male / Transgender / Non-binary; Non-conforming / Other **Age (screening)** Q: How old are you? A: Ranging from 17 or younger (excluded) up to 68 or older (also excluded) **Education** Q: Please indicate the highest level of education you have achieved to date. A: No school-leaving certificate / School Leaving Certificate or equivalent / General Certificate of Secondary Education or equivalent / General or subject-linked higher education entrance qualification / Vocational training or apprenticeship / Bachelor's degree or pre-diploma / Master's degree or diploma / PhD or higher academic degree **Nationality/Long-Term Residency (screening)** Q: Are you a German citizen or have you been living in Germany for more than 10 years? A: Yes/No ("No" = excluded) **Region of residency in Germany** Q: Which federal state in Germany do you live in? A: All 16 federal states are given as an option as well as the option "Not specified" **Income** Q: In which of the following income ranges does the total income of your household per month after deduction of taxes and social security contributions (net) fall? A: 1.000-1.999€ / 2.000-3.999€ / 4.000-5.999€ / 6.000-7.999€ / 8.000€ or more / Not specified
Food habits	**Type of diet** Q: Which of the following best describes your current diet? (screening) A: Omnivorous (no special dietary restrictions) / Vegetarian (no consumption of meat, but consumption of other animal products) /Vegan (no consumption of animal products) / Pescetarian (consumption of fish, no consumption of meat) / Flexitarian (predominantly vegetarian diet, occasional consumption of high-quality, organic meat). Vegetarians, Vegans and Pescatarians have been excluded from the survey. **Consumption of Red Meat** Q: Do you eat beef or pork several times a week? (Please also think about sausage, cold cuts, minced meat etc. A: Yes / No

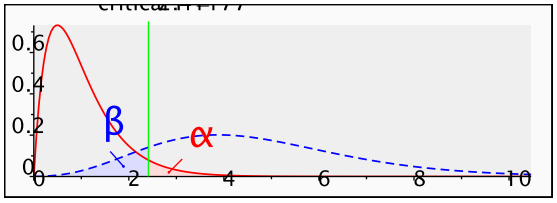
Appendix IV – Survey Completion

	Total
Initial Responses	447
Participants who did not complete the survey	80
Participants who were excluded based on age, residence and diet	64
Participants who failed the attention control questions	Post-Message-Treatment: 2
	Meat Attachment: 67
Final Sample Size	**234**

Appendix V - Post-hoc study power analysis

F tests – ANOVA: Fixed effects, special, main effects and interactions

Analysis:	Post hoc: Compute achieved power		
Input:	Effect size f	=	0.25
	α err prob	=	0.05
	Total sample size	=	234
	Numerator df	=	4
	Number of groups	=	9
Output:	Noncentrality parameter λ	=	14.6250000
	Critical F	=	2.4117681
	Denominator df	=	225
	Power (1−β err prob)	=	0.8747858



Appendix VI - Distribution of valid responses (*n*=234) per message condition, total and per gender.

	Percentage (*n*)		
Message	**Total** 100,0%(234)	**Male** 55,6%(130)	**Female** 44,0%(103)
Informational	34,6%(81)	51,9%(42)	48,1%(39)
Emotional	33,8%(79)	51,9%(41)	46,8%(37)
Dynamic Norms	31,6%(74)	63,5%(47)	36,5%(27)
Pearson χ^2 (message X gender) = 2,628, p = 0,269.			

Appendix VII - Kruskal-Wallis tests for Cluster Analysis.

Variable	χ^2	***p*-value**
Beef Steak Consumption	43,238	<,001
Sausage/Cold Cut Meats Consumption	103,362	,000
Chicken fillet Consumption	77,208	,000
Beef burger Consumption	74,709	<,001
Pork Schnitzel Consumption	75,259	,000
Chicken Nugget Consumption	25,392	<,001

Appendix VIII General Linear Model Results

Testes de efeitos entre sujeitos

Variável dependente: Reduce Red Meat

Origem	Tipo III Soma dos Quadrados	df	Quadrado Médio	Z	Sig.	Eta parcial quadrado	Noncent. Parâmetro	Poder observado[b]
Modelo corrigido	63,087[a]	9	7,010	8,936	<,001	,264	80,427	1,000
Intercepto	144,044	1	144,044	183,637	<,001	,450	183,637	1,000
Mean_MAttach_All	41,245	1	41,245	52,582	<,001	,190	52,582	1,000
CONDITION	,725	2	,362	,462	,631	,004	,924	,125
Mean_TMF_Class	3,105	2	1,553	1,979	,141	,017	3,959	,407
CONDITION * Mean_TMF_Class	1,955	4	,489	,623	,647	,011	2,492	,203
Padrão	175,704	224	,784					
Total	1147,000	234						
Total corrigido	238,791	233						

a. R Quadrado = ,264 (R Quadrado Ajustado = ,235)

b. Calculado usando alfa = ,05

Comparações por Método Pairwise

Variável dependente: Reduce Red Meat

Mean_TMF_Class	(I) CONDITION	(J) CONDITION	Diferença média (I-J)	Estatística do teste Padrão	Sig.[a]	95% Intervalo de Confiança para Diferença[a]	
						Limite inferior	Limite superior
Feminity	Knowledge	Emotions	,120	,225	,596	-,324	,564
		Norms	,457	,249	,068	-,033	,947
	Emotions	Knowledge	-,120	,225	,596	-,564	,324
		Norms	,337	,252	,182	-,160	,834
	Norms	Knowledge	-,457	,249	,068	-,947	,033
		Emotions	-,337	,252	,182	-,834	,160
Ambivalent	Knowledge	Emotions	-,034	,314	,914	-,652	,584
		Norms	-,047	,309	,880	-,655	,562
	Emotions	Knowledge	,034	,314	,914	-,584	,652
		Norms	-,013	,309	,968	-,621	,596
	Norms	Knowledge	,047	,309	,880	-,562	,655
		Emotions	,013	,309	,968	-,596	,621
Masculinity	Knowledge	Emotions	,006	,218	,976	-,423	,436
		Norms	,004	,214	,985	-,417	,425
	Emotions	Knowledge	-,006	,218	,976	-,436	,423
		Norms	-,002	,213	,991	-,423	,418
	Norms	Knowledge	-,004	,214	,985	-,425	,417
		Emotions	,002	,213	,991	-,418	,423

Baseado em médias marginais estimadas

a. Ajustamento para diversas comparações: Diferença Menos Significativa (equivalente a nenhum ajustamento).

Comparações por Método Pairwise

Variável dependente: Reduce Red Meat

CONDITION	(I) Mean_TMF_Class	(J) Mean_TMF_Class	Diferença média (I-J)	Estatística do teste Padrão	Sig.[b]	95% Intervalo de Confiança para Diferença[b]	
						Limite inferior	Limite superior
Knowledge	Feminity	Ambivalent	,273	,273	,317	-,264	,810
		Masculinity	,453*	,224	,044	,012	,895
	Ambivalent	Feminity	-,273	,273	,317	-,810	,264
		Masculinity	,180	,270	,506	-,353	,713
	Masculinity	Feminity	-,453*	,224	,044	-,895	-,012
		Ambivalent	-,180	,270	,506	-,713	,353
Emotions	Feminity	Ambivalent	,120	,274	,663	-,421	,660
		Masculinity	,340	,227	,135	-,107	,787
	Ambivalent	Feminity	-,120	,274	,663	-,660	,421
		Masculinity	,220	,274	,421	-,319	,760
	Masculinity	Feminity	-,340	,227	,135	-,787	,107
		Ambivalent	-,220	,274	,421	-,760	,319
Norms	Feminity	Ambivalent	-,230	,289	,427	-,800	,340
		Masculinity	,000	,248	,999	-,489	,490
	Ambivalent	Feminity	,230	,289	,427	-,340	,800
		Masculinity	,231	,263	,381	-,287	,749
	Masculinity	Feminity	,000	,248	,999	-,490	,489
		Ambivalent	-,231	,263	,381	-,749	,287

Baseado em médias marginais estimadas

*. A diferença média é significativa no nível ,05.

b. Ajustamento para diversas comparações: Diferença Menos Significativa (equivalente a nenhum ajustamento).

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