THE EFFECT OF SELF-BENEFIT APPEALS AND COLLECTIVE-BENEFIT APPEALS ON CONSUMERS' ATTITUDES TOWARD PLANT-BASED MEAT IN CHINA, AND THE MODERATION EFFECT OF MEAT ATTACHMENT

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SUMMARY

This research investigated the effect of self-benefit appeals and collective-benefit appeals on consumers' attitudes towards plant-based meat in China. The self-benefit appeals communicated personal health, taste, and food safety, whereas the collective appeals focused on others benefit such as environmental sustainability and animal welfare. Also, a control message without appeals was used to investigate whether advertisements with appeals or no appeals could affect consumers' attitudes. Besides, the research investigated the moderation effect of meat attachment on the relationship between appeals type (self-benefit vs collective-benefit) and attitude towards plant-based meat.

An online survey was conducted among 109 Chinese respondents. Respondents were randomly assigned to three appeals conditions, namely self-benefit appeals, collective-benefit appeals, and no appeals. Subsequently, attitude and meat attachment were measured, followed by consumer demographics such as age, gender, and education level. Finally, the appeals manipulation and randomization were checked.

The results suggest appeals type (self-benefit vs collective benefit; appeals vs no appeals) does not have a significant effect on consumers' attitude. Also, meat attachment does not play a moderator in the relationship between the appeals type (self-benefit vs collective benefit) and attitude. This research provided evidence of the effect of meat attachment on consumers' attitudes towards plant-based meat. Moreover, it shows an application of meat attachment for testing the moderators on the appeals type-attitude relationships. Eventually, it discussed the limitation of the current study, implications for marketers, and suggestions for future research.

Contents

INTRODUCTION

Like many other consumption areas, the concept of sustainable meat consumption has received tremendous attention nowadays in the food industry (Elzerman, van Boekel, & Luning, 2013; Lacour et al., 2018; Van Loo, Hoefkens, & Verbeke, 2017). According to a report published by the United Nations in 2017, 80% of the land use in the U.S. is responsible for raising animals and growing grain to feed them (UN DESA, 2017). Worldwide, raising animals for food (including land used for grazing and land used to grow feed crops) currently uses 30% of earth's landmass. In the meantime, the upward trend on population size is expected to continue, with about 83 million people being added to the world population per year (UN DESA, 2017). Given the limits of land suitable for growing crops, feeding the growing world population is a daunting challenge. Besides, livestock is considered to be responsible for 18% of the greenhouse gas emissions from anthropogenic sources at the global level (FAO, 2019). Compared to a vegetarian diet, a nonvegetarian diet consume 2.9 times more water, 2.5 times more energy, 13 times more fertilizer, and 1.4 times more pesticide (Marlow et al., 2009). The difference is caused by an inclusion of beef in the diet. Given the significant impact of the meat industry on the environment, adopting sustainable meat consumption is urgently needed (Fischer & Garnett, 2016).

Global meat consumption has increased by 58% over the 20 years to 2018, and it is expected to grow further (Whitnall & Pitts, 2019). In the 20 years to 2018, developing countries are responsible for 85% of the rise in global meat consumption. In particular, China has become a critical driving force in the meat market in the next decades because of its large population, rapid economic growth, and predicted dietary transition (Shimokawa, 2015). According to Whitnall and Pitts (2019), meat consumption has increased by about 72% in China from 1998 to 2018. This increase is accounted for 34% of meat consumption growth globally. China has consumed almost a quarter of the whole meat produced globally, and the demand is expected to grow (Shimokawa, 2015). To significantly move meat consumption in China towards a more sustainable and healthy way, meat consumption should include more plant-based meat and limited animal products consumption. Meat and dairy replacements are founded as an effective avenue to increase plant-based food consumption in the majority of the world population (Szejda, Urbanovich & Wilks, 2020). Meat substitutes are the products produced to replace meat in the meals, generally based on plant proteins (Elzerman et al., 2013).

The demand for plant-based meat is rising in China. Following the dietary guidelines released by the Chinese Government in 2016, which recommended lower meat consumption to improve public health and environmental issues, China's plant-based market has shown a positive sign in recent years. According to Euromonitor, the 'free from meat' market, including plant-based products, has increased by 33.5% since 2014. This increase is accounted to a worth of $9.7 billion in 2018, according to Euromonitor. It is also predicted that the plant-based market will be worth $11.9 billion by 2023. Moreover, Chinese consumers have found to be open up for the idea of plant-based meat in recent years. A consumer survey (Phelps, 2018) conducted by a research institute in the New Zeeland found that 39% of the Chinese population are reducing

their meat consumption. Also, the research (Bryant, Szejda, Parekh, Desphande, & Tse, 2019) revealed 62.4% of Chinese respondents were very and extremely likely to purchase plant-based meat. This group of consumers is characterized as 'disproportionately urban, high income, and well-educated'. The research (Iimedia, 2020) conducted by a Chinese research institute indicated that 14.9% of Chinese participants have a negative attitude towards plant-based meat, 30.4% have a positive attitude towards plant-based meat, and 54.7% have a neutral attitude towards plant-based meat.

Although various research showed that Chinese consumers are more open towards plant-based meat, the awareness of the environmental impact of meat consumption and the knowledge about plant-based meat is yet to improve among Chinese consumers. This was found as the reason why the majority of Chinese respondents are not sure if they would purchase plant-based meat in the previous research (Iimedia, 2020). Besides, DATA 100 (2020) - a Chinese research institute – found that 77% of the respondents have heard or used plant-based meat, but only 4% of them have an accurate understanding of plant-based meat. Health and sustainability are found as the two main reasons why Chinese consumers prefer to purchase plant-based meat, according to DATA100. Concerns about food safety and negative perception of the taste are the two main barriers to preventing consumers from purchasing plant-based products. To encourage Chinese consumers to buy and use plant-based meat, mass media attempt to increase consumers' knowledge and improve their perception towards plant-based meat. Those campaigns applied many different forms, including short videos, newspapers, scientific data, posters, etc. Some of the campaigns focus on the ingredient of plant-based meat and the way how it is produced. Others focus on product attributes related to environmental sustainability, animal welfare, and health. In the previous research (Sarker, 2016), knowledge and concerns regarding environmental protection and ethical problems are found as the best elements to motivate consumers to purchase sustainable products. However, providing more information may increases the complexity and difficulties for consumers to make decisions (Kennedy, Beckley, McFarlane, & Nadeau, 2009). Also, when the cognitive understanding is more precise, it becomes less relevant for motivational structure. Personal relevance is not related to knowledge accuracy (Van Dam & van Trijp, 2011). Hence, whether these educative campaigns could motivate Chinese consumers to purchase plant-based meat becomes doubtful.

The importance of information campaigns to motivate consumers to adopt more plant-based meat is well-acknowledged. Previous research has not yet investigated how Chinese consumers respond to these information campaigns and whether this could translate to behavior. The challenge lies in whether the persuasive messages are effective on consumers' attitudinal and behavioral outcomes. Consumers often perceive sustainable behaviors as adding cost to themselves, such as additional cost, additional effort, and inferior quality (Luchs & Kumar, 2017). Although the long-established view of consumer behavior states that consumers will choose and use what satisfies their own needs and wants (Solomon, White & Dahl, 2017), the viewpoint of sustainable consumer behavior usually emphasis the value to the external self (White, Habib, & Hardisty, 2019). As a result, plant-based meat might be perceived as an inferior (either price, taste, or food safety) product. Therefore, consumers will perceive a

trade-off in their purchasing decision. The trade-off is buying a less tasty and less safe but more expensive product for contributing to the external environment and animals and a healthier diet for themselves. In promoting plant-based meat, the campaigns that communicate food safety, healthiness, and tastiness of plant-based meat focus on the benefits to the individual self. Other campaigns promote plant-based meat' benefits to the external self - the environment, animals, other people, and future generations. As such, consumers might be more willing to make this trade-off when they see the personal benefits which are relevant to themselves through educative campaigns.

In addition, meat attachment has proved to be an important predictor of willingness to adopt a plant-based diet (Graça, Calheiros, & Oliveira, 2015). Meat attachment is described as a positive affective connection to meat. Consumers who are highly attached to meat are more resistant to reduce their meat consumption but may feel plant-based meat attractive because of the self-benefit such as health, taste, etc. In contrast, consumers who exhibited avoidance of meat showed a low-intensity positive affective connection towards meat. They are more willing to shift towards a plant-based diet. Those consumers are highly motivated to reduce their meat consumption by animal welfare. Also, those who showed a disgust (high negative affective connection) to meat do not eat much meat and expressed their concerns about animals and sustainability. Those two groups of consumers might be more open up to collective-benefit than self-benefit of eating plant-based meat. Hence, this seems to suggest that consumers who exhibited a lower meat attachment will be more open up for collective-benefit appeals than self-benefit appeals. To the author's knowledge, the role of meat attachment on the effectiveness of self- and environmental-benefit appeals, has thus far not been tested for advertising of plant-based meat in China. This study aims to fill this gap in previous research by investigating the effectiveness of self-benefit and collective-benefit appeals in generating consumers' attitudes towards plant-based meat under conditions of high and low meat attachment.

THEORETICAL BACKGROUND

Communication appeals

Communication appeals refer to those messages indicating that people should or should not do a particular behaviour in a specific situation. It is a mostly used method to encourage people to engage with sustainable behaviour (White & Simpson, 2013). A thematic review of studies investigating motivations for consuming plant-based meat in the U.S., Szejda, Urbanovich & Wilks (2020) indicated taste, familiarity, and tradition are most influential in motivating consumers to adopt plant-based meat. Consumer needs for the products such as freshness, nutrition, and healthiness are followed as the secondary drivers. Sustainability and animal welfare have less influences on purchasing decisions (Szejda et al., 2020). Persuasive arguments based on those motivational benefits are often used to encourage people to engage in a plant-based diet. However, less research were conducted to compare the effectiveness of those advertising campaigns. The previous literature review (Bianchi, Dorsel, Garnett, Aveyard, & Jebb, 2018) compared and evaluated the informational interventions that persuade people to reduce their meat consumption. The effectiveness of persuasive messages regarding the negative impact on environmental sustainability and animal welfare is limited (Bianchi et al., 2018). The same finding was explained in another research (Zur & Klöckner, 2014). According to Palomo-Vélez, Tybur, and van Vugt (2018), the possible reason could be that persuasive messages regarding environmental sustainability and animal welfare are perceived as less relevant for personal benefits of following the persuasion. While the tastiness, healthiness, and convenience have high personal relevance and, therefore, high effectiveness in motivating people. However, there was no clear evidence indicating that all of those persuasive messages impact the actual behaviour. Hence, it is crucial to dig deeper into how varied consumers respond to different information interventions that promote plant-based meat.

All too often, the most commonly used appeals to encourage consumers to engage in a sustainable behavior emphasis the personal benefits and group benefits (White & Simpson, 2013). Advertisers often communicate the group benefits such as the benefits of the green products to the external environment and animal welfare since   green consumption are often associated with the benefits for some other individuals and society. Some researchers revealed that green consumption is more likely to happen when the products are associated with the benefits to others. Webb, Mohr, and Harris (2008) suggested that socially responsible consumption is driven by a society-oriented value rather than a self-centered value. Davis (1994) argues that consumers focus more on the environmental impact of the products than personal interest when it comes to green purchasing. Consumers might be willing to give up the personal benefits to buy a sustainable product for the benefits to society and the environment (Griskevicius, Tybur, & Van den Bergh, 2010).

In contrast, other researchers argue that personal benefit is more powerful in motivating most consumers to purchase plant-based meat. According to Hartmann, Ibáñez and Sainz (2005), personal benefit is more important to most consumers and advertisers should increase consumer perception of personal benefits of purchasing a sustainable product rather than

sustainability benefit. Also, previous research argues that egoistic (self-centered) value is based on most pro-environmental behavior (de Groot & Steg, 2008; Stern, 2000). Holmes, Miller, and Lerner (2002) suggested that consumers are more likely to engage in sustainable behavior when it is accompanied by some form of benefits to the self. To help most consumers make the trade-off easier, marketers try to increase the personal benefits to individual consumers through self-benefit appeals (White & Simpson, 2013). Personal health is the primary driver to motivate consumers to purchase plant-based meat both in the Western and Eastern countries, according to the previous research conducted in the U.S. and China (Data100, 2020; Szejda et al., 2020). Consumer needs for the products such as tastiness, nutrition, and freshness are influential for consumers' purchase intention of plant-based meat in the U.S. (Szejda et al., 2020). The negative perception of taste and concerns about food safety is the main barrier for Chinese consumers to adopt plant-based meat (Data100, 2020). Communication about these issues could guide these consumers to understand the product better and improve their perception of plant-based meat. As a result, advertising intervention that focus on personal benefit is more effective than collective benefits in motivating consumers to purchase plant-based meat. The current research will compare the effectiveness between self-benefit appeals and collective-benefit appeals.

Targeted messages: meat attachment

Consumers are varied in their beliefs, values, and behavior towards plant-based meat alternatives, resulting in a different preference towards self-benefit and collective-benefit appeals. According to Szejda et al. (2020), shaping the intervention for a target consumer segment could improve effectiveness. The advertising appeals and messages targeted at a specific group are more effective than the standard messages to the average consumer. Targeted messages mainly attempt to understand and influence the shared characteristics of a subgroup (Kreuter & Wray, 2003) and may lead to consumer adoption of plant-based meat (Szejda et al., 2020).

Targeting messages could be done by segmenting consumer subgroups by shared meat consumption characteristics. Previous literature found an emotional connection to meat is the main barrier to reduce meat intake and adopt a more plant-based diet (Graça, Oliveira, & Calheiros, 2015). Positive or negative affects towards meat are associated with consumer attitude, intention, and meat consumption (Berndsen & Van Der Pligt, 2004). This positive connection to meat is called meat attachment. Also, meat attachment is found as a strong predictor of purchase intent in China (Bryant et al., 2019). Graça et al. (2015) categorized consumers into three types of meat attachment type: 1) people who feel disgusted about meat; 2) people who showed avoidance of meat; 3) people who are attached to the meat. Almost half (49%) of the respondents are "attached" to meat consumption. These regular meat consumers showed a strong positive affective connection to meat and they are more resistant to take more plant-based meals. Besides, those who showed an avoidance of meat (37%), showed a low affective positive connection to meat, are more willing to shift towards a plant-based diet. Lastly, participants that feel disgusted about meat make up 14% of the whole sample population. This group showed a high negative affective connection to meat and did not report eating meat.

Traditional meat consumers or those who held a high attachment to meat are primarily motivated to eat conventional meat due to the taste, price, and affective connection to meat (Szejda et al., 2020). Consumers who are highly attached to meat showed the feeling of dependency and sadness when thinking about stop eating meat (Graça et al., 2015). According to Lang (2020), regular meat-eaters do not consider reducing their meat consumption but seek new ways for healthier eating. Exposure to information regarding the collective-benefit such as animal welfare and environmental sustainability was not sufficient to change the attitude of those who are highly attached to the meat. Also, it may lead to a negative response and unwillingness to take a more plant-based meal. The intervention which highlights the self-benefit such as taste and health could probably enhance their perception of the personal benefit of purchasing plant-based meat, and therefore, more willing to make the trade-off between self-interest and others benefit. Therefore, those consumers who have a high affective connection towards meat tend to have a more positive reaction toward self-benefit appeals than collective-benefit appeals.

Consumers who showed avoidance of meat held a low-intensity positive affective connection to meat. This group of consumers is more willing to alter toward a plant-based meal since they concern about animal welfare (Graça et al., 2015). Also, Szejda et al. (2020) reviewed the relevant literature and suggested that this type of consumer is highly motivated to choose plant-based meat by environmental sustainability and animal welfare. Consumers who showed a high "disgust" toward meat also held a negative affective connection toward meat. They do not have much meat intake. According to Graça et al. (2015), those consumers expressed ethical concerns such as harm imposed on animals. Hence, those two types of consumers might be more open up to the information that emphasizes the collective benefit rather than self-benefit.

As explained above, consumers who showed low meat attachment are highly motivated by altruistic value such as animal welfare and environmental sustainability. The traditional meat-eaters who are highly attached to meat are more concerned about their own benefits and interests, such as health, taste, and convenience than the benefits to others, such as animal welfare and environmental issues. As such, this study assumes that the effectiveness of self-benefit and collective-benefit appeals are also dependent on meat attachment. Consumers with a higher meat attachment are more likely to show a positive reaction towards self-benefit appeals, whereas consumers who showed a lower meat attachment are more likely to show a positive reaction towards collective-benefit appeals.

Attitude towards plant-based meat

Consumer attitude towards plant-based meat alternatives is critically essential for a successful launch into the food market (He, Evans, Liu, & Shao, 2020). The Theory of reasoned action (TRA) (Ajzen & Fishbein, 1980) and the Theory of planned behavior (TPB) (Ajzen, 1985) are the two leading theoretical approaches applied by a large number of studies regarding consumer behavior. Both of them explained that attitude is an essential determinant of purchase intention. The prior research indicated that informational intervention could influence consumer attitudes. According to the study conducted in the U.S., the communication message regarding meat impacts is proved to be influential for consumer attitude (Palomo-Vélez et al., 2018). Also,

providing information that indicates the importance/benefit of taking plant-based meat is highly relevant for those who lack knowledge (Amiot, El Hajj Boutros, Sukhanova, & Karelis, 2018). The lack of knowledge could result in a negative attitudinal outcome – for example, meat is essential to health - which possibly becomes a barrier for consumers to reduce meat consumption and then take a less plant-based meal (Dibb & Fitzpatrick, 2014). As a result, consumer attitudes are crucial to take into account when exploring the effectiveness of communication appeals.

Hypotheses

The current study will examine whether consumer attitudes differ for consumers when they are presented with marketing communications, in the form of advertising appeals, which promote either a purely environmental and animal benefit to plant-based meat, versus a personal benefit to plant-based meat. The previous research suggests that egoistic value is more powerful than the altruistic value in sustainable purchasing. It is therefore assumed that self-benefit appeals are more effective than collective-benefit appeals. However, in some cases, collective-benefit appeals are more effective than self-benefit appeals. The effectiveness of communication appeals is also dependent on meat attachment. The current study assumes that collective-benefit appeals are more effective than self-benefit appeals when consumers exhibited a lower meat attachment. In contrast, self-benefit appeals are more effective than collective-benefits for consumers who have a higher meat attachment. Also, the types of appeals which receive a more positive attitude therefore lead to higher effectiveness in motivating consumers to adopt plant-based meat. Hence, the hypothesis is described as followed:

H1: Self-benefit appeals lead to a more positive attitude than collective-benefit appeals.

H2a: Collective-benefit appeals lead to a more positive attitude than self-benefit appeals when participants showed a lower meat attachment.

H2b: Self-benefit appeals lead to a more positive attitude than collective-benefit appeals when participants showed a higher meat attachment.

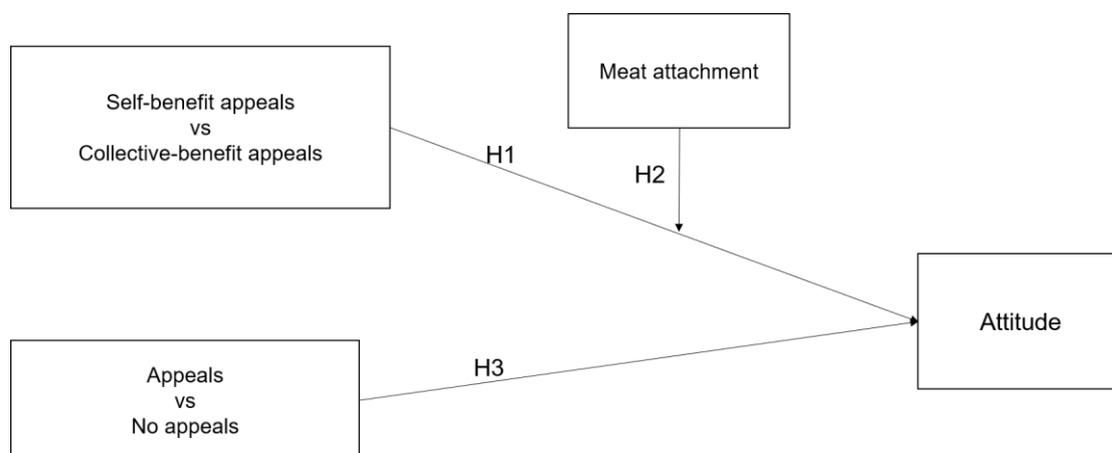H3: Appeals lead to a more positive attitude than no appeals.

Figure 1. Conceptual framework

METHODOLOGY

Design, procedure and materials

This study employed a between-subjects design which means three groups of participants exposed to three different advertising appeals (self-benefit appeals, collective-benefit appeals, control group). Participants are randomly assigned to one of the 3 different conditions. The three advertising appeals all promote plant-based meat. The same image is used but the appeals are different for the three groups of consumers. Self-benefit appeals contain the information regarding personal-health, taste and food safety of plant-based meat. Collective appeals indicate the benefits of plant-based meat to the planet and animal welfare. Control group uses the same advertising image but does not contain any benefit appeals.

An online survey is preferred in this research. The questionnaires were all translated into Mandarin – the official language in China. Consumer demographics such as birth year, gender, education level were asked in the questionnaire. The education level in China is different from other countries. The online survey was shared among Chinese groups via social media i.e. WeChat. The respondents were also be informed that their answers are kept anonymously and only used for research purposes.

Communication appeals

Respondents were invited to fill in the questionnaires that contain one of the three types of communication appeals. The three types of advertising appeals consist of the same image that illustrates plant-based meat, the same title that says plant-based meat, and a sentence that says "come and buy the plant-based meat." All messages are in Chinese. As explained in the introduction, health, taste, and food safety are found as important motivators related to self-benefit for Chinese consumers. Environmental sustainability and animal welfare are the two leading factors related to collective-benefit for Chinese consumers to choose plant-based. In the two experimental conditions, the self-benefit appeals (figure 2) therefore focus on the personal-health, taste, and food safety of plant-based meat, whereas the collective-benefit (figure 3) appeals illustrate the impact of plant-based meat on the environment and animal welfare. The texts that describe self-benefit of health are "high protein, low calories, low cholesterol: adopting more plant-based meals could prevent Chronic diseases such as cancer, heart diseases, and diabetes." The arguments concerning health benefits are based on the findings from the research that compared the health benefit of plant-based meat with animal-based meat (Crimarco et al., 2020). The texts for self-benefit of taste are "new tasty recipes, its texture is very close to real meat",   and the text messages for food safety are "National food quality and safety certificate stamped, it is safe, trustful and in good quality." In the collective-benefit appeals, the texts for the environment are illustrated as "producing 1 kg meat equals emitting 36.4 kg of CO2, whereas taking plant-based meal for one day equals to planting 100 trees back to nature, please save the planet and eat more plant-based meat". The arguments regarding environmental concerns are based on a piece of Chinese campaign news (Daily Headline, 2019) and the literature concerning the environmental impact of animal-based meat and plant-based meal (Ogino, Orito, Shimada, & Hirooka, 2007). Also, the collective-benefit of

animal welfare is described as " one person become vegetarian, 20,000 lives will be saved, please adopt a loving-kindness diet and save the lives". The arguments regarding animal welfare are based on the news of Daily Headline (Daily Headline, 2019). The control group (figure 4) does not contain benefit appeals.

Figure 2. Self-benefit appeals

Figure 3. collective-benefit appeals

植物肉

一起下单吧！

Figure 4. control group: no appeals

Before the respondents start to answer the questionnaire, a short introduction was exhibited. The questionnaire (see Appendix 1) consists of two parts. Part 1 started with showing the communication appeals to respondents. The participants were asked to read the advertisement carefully and answer the questionnaire. First of all, consumers attitude towards the plant-based meat which are communicated through the advertisement were asked. Afterwards, consumers were asked to fill in their answers on the scale which measures their meat attachment. The second part was placed at the second page and started to check whether consumers can recognize whether the advertisement focus on self-benefit, collective-benefit or no benefit. Finally, consumers demographics were asked.

Measures

Attitude

Consumer attitude towards plant-based meat was asked on the 5-item measures with a 7-Likert scale ranging from 1 to 7. These five items are "bad–good", "unpleasant–pleasant", "against–for", "unfavorable–favorable", "negative–positive" (Berndsen & Van Der Pligt, 2004; Graça et al., 2015). For instance, the item "bad–good" is "I think adopting plant-based meat that is communicated through this advertisement is good" in the questionnaire. Cronbach's alpha for the concept of attitude is .92.

Meat attachment

In order to measure meat attachment, the Meat Attachment Questionnaire developed by Graça et al. (2015) was utilized in the current study. The Meat Attachment Questionnaire consists of four subscales, namely hedonism, affinity, entitlement and dependence. In totoal, 16 items measures meat attachment. The hedonism subscale consists of 4 items, measuring the extent to which participants see meat as a source of pleasure. The 4 items are: "Eating meat is one of the pleasures in life", " I like meals with meat", " I am a big fan of meat", and "You can compare

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nothing with a good piece of steak". Higher score refers to meat represented as a source of pleasure. The affinity subscale measures the affinity with meat consumption. It consists of 4 items that are measured in opposition to repulsion ("By eating meat I'm reminded of the death and suffering of animals", "To eat meat is disrespectful towards life and the environment", "Meat reminds me of diseases", and "I feel bad when I think of eating meat"; reversed score). Entitlement indicates the feeling that people have right to eat meat. The 3 items of entitlement subscale are: "To eat meat is an unquestionable right of every person", "According to our position in the food chain, we have the right to eat meat", and "Eating meat is a natural and undisputable practice". Lastly, the dependence subscale measures the degree to which people can not do without meat. The 5 items of dependence are: "I don't picture myself without eating meat regularly", "If I couldn't eat meat I would feel weak", "I would feel fine with a meatless diet (reversed score)", "If I was forced to stop eating meat I would feel sad" and "Meat is irreplaceable in my diet". Cronbach's alpha for the concept of meat attachment is .97. The respondents were divided into two groups based on the median of mean meat attachment: either being low in meat attachment (4.37).

Manipulation checks

Participants are randomly assign to the 3 conditions (self-focused benefit, other-focused benefit, control group). These manipulations are checked on a 7-point Likert scale from 1-"strongly disagree" to 7- "strongly agree" ("The appeal communicated through this advertising focused on the environment and animal welfare", "The appeal communicated through this advertising is associated with the concerns to the environment and animal welfare", " The appeal communicated through this advertising focused on consumer's oneself interest", "The appeal communicated through this advertising is associated with looking out for one's own interests".) These two pairs of items were proved to be reliable scale to evaluate self-benefit appeals and collective-benefit appeals in the previous research (White & Peloza, 2009). Cronbach alpha for self-benefit check is .65 and Cronbach alpha for collective-benefit check is .95.

Consumer demographics

Consumer demographics such as gender, age and education level were asked in the questionnaire. The education level in China is divided into four parts, namely secondary school, technical degree, bachelor's degree, and master's degree (OpenLearn, 2019). When the Chinese finished his/her primary, junior, and senior education that consists of 12 years, he/she complete secondary education. Afterward, there are two ways to go on with their education, technical university, or academic university. Technical university ends up with a diploma with a technical degree which is hierarchically lower than the level of the degree of bachelor which is obtained from an academic university. When Chinese get a bachelor degree, he/she can continue their education until a master degree, doctor degree, and so on. In the current study, the education level was be categorized into four-part: 1) secondary education or lower, 2) technical degree, 3) bachelor degree, and 4) master degree or higher.

Participants

The survey received completed answers from 109 Chinese respondents. The survey's randomized distribution leads to 39 respondents filled in the questionnaire for self-benefit appeals, 36 respondents filled in the questionnaire for collective-benefit appeals, and 34 respondents filled in the questionnaire for no appeals. The participants consists of a group of young, mostly female, and highly educated Chinese. Around 69% of the respondents age at 18- 30 years. The rest of respondents are distributed in the age of 31-40, 41-50, and 50-60 years. Besides, around 70% respondents are male. Also, 56% of the respondents obtained a master degree and 32% of the respondents obtained a bachelor degree. Figure 5, 6 and 7 shows the respondents characteristics in terms of age %, education level % and gender %.
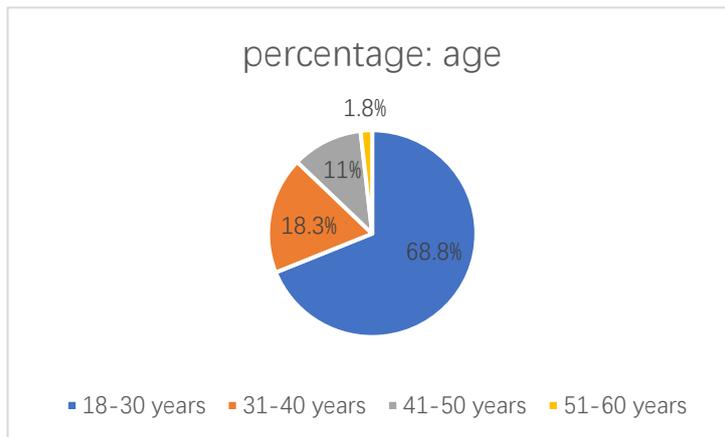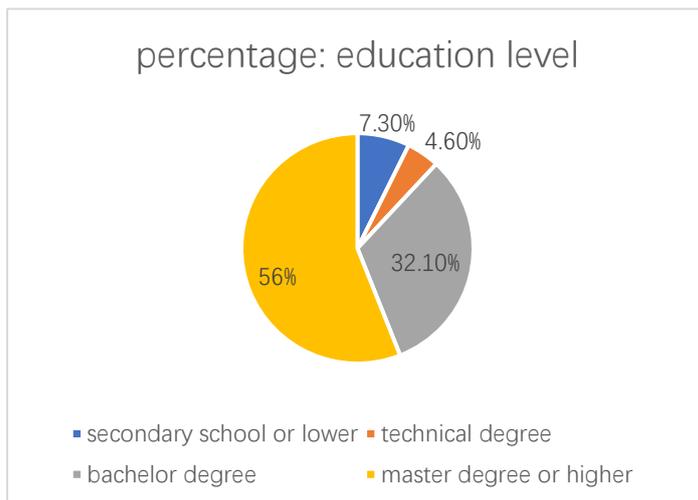

Figure 5. percentage: age

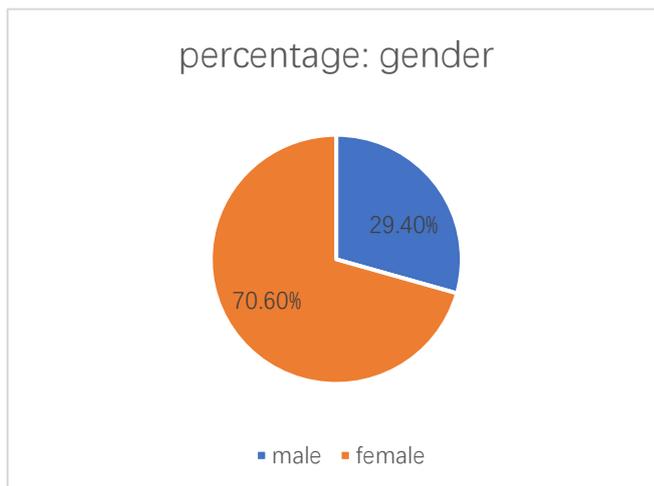Figure 6. percentage: education level

Figure 7. percentage: gender

Strategy of Analysis

Data analysis was conducted with IBM SPSS Statistics version 25. First of all, scale validation was checked by reliability test and factor analysis. To check whether the randomization is successful, One-factor analyses of variance (ANOVA) and Pearson's X^2 tests were performed to test for differences between experimental conditions for age, gender, education level, meat attachment. Manipulation check are followed as the third step. Manipulation checks were performed to make sure that the appeals used were perceived in the desired manner. This was done by conducting a means of analyses of variance between ratings of self-benefit and collective-benefit. Also, respondents were divided into two groups with a high meat attachment (> 4.37) and a low meat attachment (< 4.37). A 2x2 (self-benefit and collective-benefit; high meat attachment and low meat attachment) Univariate ANOVA was used to test whether main effects of the type of communication appeals and the interaction effects (type of appeals x meat attachment) existed on attitude. Finally, One-factor analyses of variance (ANOVA) was conducted to test whether there is a significant difference of attitude between appeals and no appeals.

RESULTS

Scale validation

Cronbach's alpha and factor score for all scales were calculated and shown in table 1. It is considered that a reliability coefficients of .70 as sufficient (Nunnally, 1979). The majority of the scales have a sufficient reliability according to the Cronbach alpha value. For those multi-item scales, the mean score were calculated for the data analysis. The 2-item scale which measures self-benefit has a Cronbach alpha of .65 which is very closed to .7. Using factor analysis it was examined the factor score for each item. Four factors with eigenvalues greater than one were extruded. An Oblimin rotation was performed and the pattern matrix is showed in table 1.Only factor score that higher than .5 is shown. The four factors are meat attachment, attitude, manipulation check for collective benefit and self-benefit. The results of reliability test and factor analysis proved that all scales used in the current study are valid.

Table 1. factor analysis

Item description	Factor			
	1	2	3	4
Eating meat is one of the pleasures in life	.929			
I like meals with meat	.907			
I am a huge fan of meat	.914			
You can compare nothing with a good piece of steak	.830			
To eat meat is an unquestionable right of every person	.835			
According to our position in the food chain, we have the right to eat meat	.861			
Eating meat is a natural and undisputable practice.	.860			
I do not picture myself without eating meat regularly	.920			
If I could not eat meat I would feel weak	.898			
I would feel fine with a meatless diet*	.867			
If I was forced to stop eating meat I would feel	.928			

sad				
Meat is irreplaceable in my diet	.785			
By eating meat I am reminded of the death and suffering of animals*	.818			
To eat meat is disrespectful towards life and the environment*	.826			
I feel bad when I think of eating meat*	.846			
Meat reminds me of diseases*	.732			
Attitude bad—good		.830		
Attitude Unfavorable – favorable		.878		
Attitude Negative – positive		.824		
Attitude Against – for		.889		
Attitude Unpleasant – pleasant		.922		
The appeal communicated through this advertising focused on the environment and animal welfare.			-.968	
The appeal communicated through this advertising is associated with the concerns to the environment and animal welfare.			-.964	
The appeal communicated through this advertising focused on consumer's oneself interest.				.811
The appeal communicated through this advertising is associated with looking out for one's own interests.				.818
Percentage of variance	56.12	11.91	5.77	4.52
Eigen value	14.03	2.98	1.44	1.13
Cronbach alpha	.97	.92	.95	.65

*reversed score

Randomization check

One-factor analyses of variance (ANOVA) and Pearson's X^2 tests were performed to test for differences between experimental conditions for birthyear, gender, education level, and meat attachment. There is no significant difference between experimental conditions for age (F(2, 107)= 1.69, p= .189), gender X^2(2, 105)=.436, p=.804), and education level (F(2,106)=2.6, p=.079). Therefore, the randomization was successful.

Manipulation check

One factor analyses of variance (ANOVA) were performed to test whether the self-benefit appeals were rated as being more focused on consumers' self-interest and the collective-benefit appeals were rated as being more focused on others' benefit such as animal welfare and environmental sustainability. The results indicated that there is a significant difference between advertisement appeals for both rated self-benefit (F(2,106)=7.80, p=.001) and collective-benefit (F(2,106)=7.78, p=.001). Specifically, the rated self-benefit of self-benefit appeals (M=4.95, SD=1.10) is significantly higher than collective-benefit appeals (M=4.32, SD=1.35) and no appeals (M=3.96, SD=.93). The rated collective-benefit of collective-benefit appeals (M=5.36, SD=1.30) is significantly higher than no appeals (M=3.96, SD=1,55) but not significantly higher than self-benefit appeals (M=4.68, SD=1.6). Additionally, both the means of rated self-benefit and collective benefit of self-benefit appeals and collective-benefit appeals are higher than neutral value 4. Therefore, self-benefit appeals are perceived as being more focused on self-benefit than collective-benefit appeals and no appeals. Collective-benefit appeals are perceived as being more focused on collective-benefit than no appeals. Overall, the manipulation worked out fine.

Correlations

Pearson's correlations were performed for the variables of age, education level, meat attachment, and attitude. Table 2 displays the correlation coefficients of all variables. There was a negative correlation found between age and education level, and between age and meat attachment. The respondents who are younger tend to have a higher education level (r=-.23, p<.01) in this study. Similarly, the older respondents are, the higher meat attachment they exhibited (r=-.52, p<.01). Another positive correlation were found between age and attitude (r=.34, p<.01). Moreover, two negative correlations were significantly proved. Participants who obtained a higher education level has a more negative attitude (r=-.24, p<.01). When people exhibit a higher meat attachment, they showed a more negative attitude (r= -.55, p<.01).

Table 2. Correlation matrix

Variable	1	2	3	4
1.Age				
2.Education level	-.23*			
3.Meat attachment	-.52**	.15		
4. Attitude	.34**	-.24*	-.55**	

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

Hypothesis testing

In general, consumers attitude is relatively high with a mean of 5.9. only 20.2% of the respondents have a negative attitude (<4). One factor analyses of variance (ANOVA) were performed to test whether there is a significant difference in attitude between self-benefit appeals and collective-benefit appeals. The results showed that there is no significant difference in attitude between self-benefit appeals and collective-appeals ($F_{(2,106)}=1.37$, $p=.26$), implying rejection of hypothesis 1.

Besides, A 2x2 (self-benefit and collective-benefit; high meat attachment and low meat attachment) Univariate ANOVA was used to test whether the interaction effects (type of appeals x meat attachment) existed on attitude. The respondents were divided into two groups based on the median of mean meat attachment: either being low in meat attachment (<4.37) or high in meat attachment (>4.37). Also, a mean plot (figure 8) was computed to show how the mean value of attitude obtained from self-benefit appeals and collective-benefit appeals differs between a high and low meat attachment. Both the respondents who showed a high meat attachment and a low meat attachment hold a slightly more positive attitude towards self-benefit appeals than collective-benefit appeals. However, the difference is not significant proved.
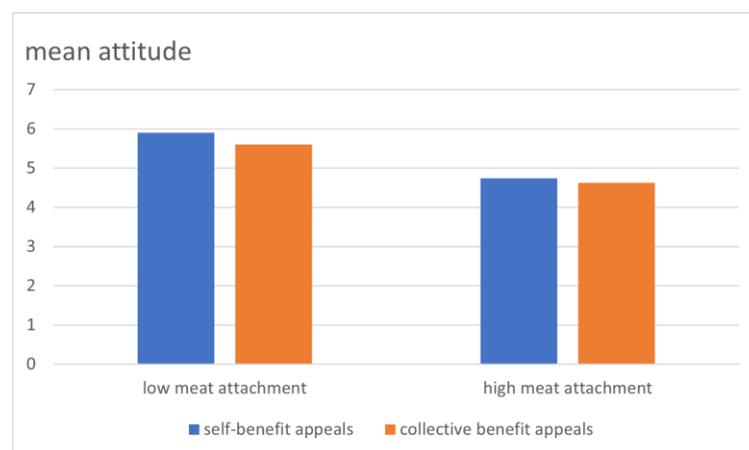

Figure 8. attitude mean of self-benefit appeals and collective-benefit appeals by high/low meat attachment

The results of Univariate ANOVA, Mean and SD are showed in table 2. The results showed that there is no main effect of appeals type ($F_{(2,102)}=.669$, $p=.52$) and interaction effect of meat attachment and appeals type ($F_{(2,102)}=.08$, $p=.92$) on attitude towards plant-based meat, suggesting rejection of hypothesis 2. Additionally, the main effect of meat attachment on attitude was found ($F_{(1,102)}=33.193$, $p=.00$).

Table 3. the main effect of appeals types, meat attachment, and the interaction effect

Variables	Low meat attachment (n=54)			High meat attachment (n=55)			Main effect a p value	Main effect b p value	Interaction effect p value
	A1 (n=20)	A2 (n=22)	No appeals (n=12)	A1 (n=19)	A2 (n=14)	No appeals (n=22)			
Outcome variables									
Attitude	5.9 (.84)	5.6 (1.1)	5.5(1.1)	4.66 (.8)	4.5 (1.1)	4.57 (.89)	.52	.00**	.92

Note: All values are in means (SD)

A1: self-benefit appeals, A2: collective-benefit appeals

Main effect a: main effect of appeals types; main effect b: main effect of meat attachment; interaction effect: the effect of appeals types x meat attachment

**p value > .01

Moreover, one factor analyses of variance (ANOVA) were performed to test hypothesis 3. There is no significant effect of the advertisements (with appeals x without appeals) on attitude $(F_{(1,106)}=2.5, p=.12)$. The attitude towards plant-based meat obtained from advertisements with appeals (M=5.22, SD=1.05) is not significantly higher than the advertisement without appeals (M=4.88,SD=1.17), implying rejection of hypothesis 3.

Table 4. the effects of appeals types on attitude

Outcome variable	Experimental conditions		Test Statistics	p value
Attitude	Appeals (N=75)	No appeals (N=34)		
	5.22(1.05)	4.88(1.17)	$F_{(1,107)}=2.5$	.12

Note: All values are in Mean(SD)

DISCUSSION AND CONCLUSION

The current study aims to investigate the effectiveness of self-benefit and collective-benefit appeals in generating consumers' attitudes towards plant-based meat under conditions of high and low meat attachment. Also, a control condition without appeals was used to test whether advertisement with appeals and without appeals does have an effect on attitude. The results of the current study suggest that the types of appeals (self-benefit vs collective benefit) does not have a significant effect on attitude. The advertisement with appeals or without appeals does not have a significant effect on attitude. Also, the moderating effect of meat attachment was not found. The degree of meat attachment does not affect how consumers react to different advertisements for plant-based meat.

Previous studies argue the effectiveness of self-benefit appeals and collective-benefits appeals. Some support that the self-benefit appeals are more effective, others argue the environmental/animal-benefit appeals are more effective. Holmes et al. (2002) found that promoting a personal benefit to a charity increased individuals' willingness to donate. Also, Holmes et al. (2002) also suggested that consumers are more likely to engage in sustainable behavior when it is accompanied by some form of benefits to the self. However, this was not found in the current study. It may mean that the effectiveness of appeals does not rely on whether the appeals are focused on self-benefit or collective-benefit. However, there also could due to varied causes.

The first reason could be related to appeals manipulation. Previous literature (Bianchi et al., 2018; Szejda et al., 2020) investigated the effectiveness of different communication appeals, such as appeals focus on health, taste, environmental sustainability, and animal welfare. The appeals that contain health benefits is more effective than the appeals that focus on environmental sustainability and animal welfare. The current study attempted to link the benefits of personal health, taste, and food safety with self-benefit, and link the impact of the plant-based meat on the environment and animals with collective-benefit. The results of the manipulation check show that appeals communicating health, taste, and food safety are perceived as being more focused on self-benefit than collective-benefit, the appeals communicating environmental sustainability and benefits to animals are perceived as being more focused on collective-benefit than no appeals. However, both self-benefit appeals and collective-benefit appeals obtain a mean (focusing on self-benefit) higher than the neutral value "4". Also, the appeals that communicate benefits to environmental sustainability and animals are perceived as being neither more nor less focused on collective-benefit than self-benefit appeals. This suggests that respondents have difficulties to distinguish the extent of collective-benefit/self-benefit communicated in the two manipulated appeals. Even though the manipulation worked out fine, but this may need more caution to conclude.

White & Simpson (2013) found that the activation of the level of the personal self and collective self moderates the effectiveness of appeals that communicating self-benefit (self-benefit appeals) and what the society/other people are doing or should be doing (descriptive/injunctive

norms) for sustainable behavior. The activation of personal self was manipulated through wording "you, your, I" in the advertisement, whereas the activation of collective self was done by the wording "we, us". When the personal level of self is activated, self-benefit appeals lead to a more positive attitudinal outcome than descriptive/injunctive norms. In contrast, descriptive/injunctive norms tend to obtain a more positive attitude and intention than self-benefit appeals. In the current study, the appeals manipulation lacks the activation of personal and collective levels of self, may making it hard for respondents to interpret and focus on the content of self-benefit or collective-benefit communicated in the advertisement. More studies should be followed by taking the manipulation of the collective/personal level of self into account.

Previous literature suggests targeting messages could improve effectiveness. The meat attachment types ("attached", "avoidance", and "disgust") was suggested as one important factor for segmentation (Graça et al., 2015; Szejda et al., 2020). People who showed a low meat attachment would be more open up to intervention that communicates sustainability and animal welfare (Szejda et al., 2020). Contrast with those findings, the attitude obtained from self-benefit appeals and collective-benefit appeals are not dependent on meat attachment. No evidence was found that meat attachment affects consumers' attitudes generated from different appeals. Limited literature was found for the moderation effect of meat attachment. However, in line with Bryant et al. (2019), an additional finding of the current study suggests that meat attachment is an important predictor of consumers' attitudes towards plant-based meat in China. The importance of meat attachment in predicting the Chinese adoption of plant-based meat should be pressed in further research.

Another finding in the current research is that with or without appeals does not significantly affect consumers' attitudes towards communicated plant-based meat. This may suggest that attitude towards plant-based meat is not dependent on the advertisement with or without appeals. Apart from the limitation of appeals manipulation, another reason could be that the respondents can only see the appeals on the first page, and probably most of them only scan the advertisement for one time. The previous literature suggests that memory plays an important role in designing advertisements. Advertisers have been pressing on finding the desired "cue" that consumers' memory could be unlocked and used in decision making (Keller, 1987, 1991). The messages or images that are placed on long-term memory can never be forgotten (Hunter, 1964; Franzen & Bouwman, 2001). This suggests that only seeing the appeals once is too short to be recognized, processed, and memorized. It could be a reason why the results are contrasted with the expectation. Also, it could be an explanation for the rejection of hypothesis 1 and 2. This information should be taken into account for future research.

This research attempt to predict the effectiveness of different advertisement appeals by comparing consumers' attitude rather than intention and actual behavior. Even though attitude is a crucial determinant of purchase intention, this limitation still needs to be considered because of the attitude-behavior gap. More research should be conducted to investigate the effect of different appeals on purchase intention and actual behavior.

Generally, the attitude of Chinese consumers towards communicated plant-based meat is relatively high in the current research. The respondents are mostly female, young, and highly educated. The results also suggest that people of an older age, a lower education level, and a lower meat attachment tend to have a more positive attitude towards communicated plant-based meat. The information could be applied for segmentation for marketers, researchers, and policymakers alike.

For future research, apart from the issues mentioned above, more aspects should be taken into account when investigating the effectiveness of communication appeals. For example, Domigan, Glassman, Miller, Hug, & Diehr (2015) emphasize the importance of the advertising appearance (e.g. graphic images, brighter color) and the arguments length and quality for improvement of likeability, understanding, and motivation of the message. Also, according to Wu and Wang (2011), source credibility indicates the level of believability towards information and their sources. The trustiness of a message is determined by source credibility. Thereby, source credibility of the message, advertising appearance and argument quality are essential to be considered in further research.

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APPENDIX: QUESTIONNAIRE

Introduction

Dear readers,

Thank you for participating in my thesis research. This questionnaire is part of a BSc. thesis research which aims to investigate how the types of advertising affect Chinese consumers' purchase behavior towards plant-based meat. This questionnaire will only take 5 minutes. You will remain completely anonymous in this research and you answers are used for research purposes ONLY. If you have more questions regarding my research, please do not hesitate to send an email to my email address: xiaoxiao1.peng@wur.nl. Thank you again for your participation.

Q1-1. Self-benefit appeals

Q2-1. Collective-benefit appeals

Q3-1. No appeals

Please read the advertisement carefully and rate your agreement for each of the following statements on a 7-point scale.

I think plant-based meat that is communicated through this advertisement is:

Q1: 1-very bad, 2-bad, 3- slightly bad, 4-I don't know, 5- slightly good, 6- good, 7-very good

Q2: 1-very unpleasant, 2-unpleasant, 3- slightly unpleasant, 4-I don't know, 5- slightly pleasant, 6- pleasant, 7-very pleasant

Q3: 1-very unfavourable , 2-unfavourable , 3- slightly unfavourable , 4-I don't know, 5- slightly favourable , 6- favourable , 7-very favourable

Q4: 1- very negative, 2- negative, 3-slightly negative, 4-I don't know, 5- slightly positive, 6- postive, 7-very positive

Q5. I am __ plant-based meat that is communicated through this advertisement.

1-   very against , 2- against, 3- slightly against , 4-I don't know, 5- slightly for , 6- for, 7-very for

Please rate your agreement for each of the following statements on a 7-point scale from 1- strongly disagree to 7- strongly agree (Strongly disagree-1, Disagree-2, Slightly disagree-3, I don't know-4, Slightly agree-5, Agree- 6, Strongly agree-7)

Q6. Eating meat is one of the pleasures in life
Strongly disagree -----------Strongly agree

Q7. I like meals with meat
Strongly disagree -----------Strongly agree

Q8. I am a huge fan of meat
Strongly disagree -----------Strongly agree

Q9. You can compare nothing with a good piece of steak

Strongly disagree -----------Strongly agree

Q10. To eat meat is an unquestionable right of every person
Strongly disagree -----------Strongly agree

Q11. According to our position in the food chain, we have the right to eat meat
Strongly disagree -----------Strongly agree

Q12. Eating meat is a natural and undisputable practice.
Strongly disagree -----------Strongly agree

Q13. I do not picture myself without eating meat regularly
Strongly disagree -----------Strongly agree

Q14. If I could not eat meat I would feel weak
Strongly disagree -----------Strongly agree

Q15. I would feel fine with a meatless diet
Strongly disagree -----------Strongly agree

Q16. If I was forced to stop eating meat I would feel sad
Strongly disagree -----------Strongly agree

Q17. Meat is irreplaceable in my diet
Strongly disagree -----------Strongly agree

Q18. By eating meat I am reminded of the death and suffering of animals
Strongly disagree -----------Strongly agree

Q19. To eat meat is disrespectful towards life and the environment
Strongly disagree -----------Strongly agree

Q20. I feel bad when I think of eating meat
Strongly disagree -----------Strongly agree

Q21. Meat reminds me of diseases.
Strongly disagree -----------Strongly agree

--------next page------
Q21: The appeal communicated through this advertising focused on consumer's oneself interest. (Strongly disagree-1, Disagree-2, Slightly disagree-3, I don't know-4, Slightly agree-5, Agree- 6, Strongly agree-7)
Strongly disagree----strongly agree

Q22: The appeal communicated through this advertising is associated with looking out for one's own interests.
Strongly disagree----strongly agree

Q23: The appeal communicated through this advertising focused on the environment and animal welfare.
Strongly disagree----strongly agree

Q24: The appeal communicated through this advertising is associated with the concerns to the environment and animal welfare.
Strongly disagree----strongly agree

Q25: What is your gender?
____

Q26: What is your age?
____

Q27: What is your education level?
A. Secondary education
B. Technical degree
C. Bachelor degree
D. Master degree