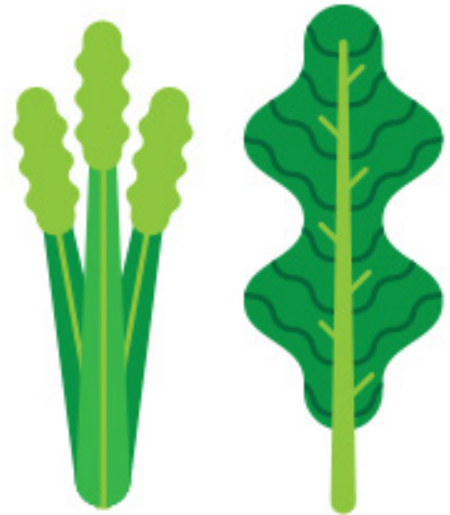


Erasmus



“How to Turn People Green”

Nudging Sustainable Food Choices

**MSc Economics and Business:
Marketing**

Master Thesis

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Academic Year: 2016-2017

“Nothing will benefit human health and increase the chances for survival of life on Earth as much as the evolution to a vegetarian diet.”
- A. Einstein

Abstract

Climate change is the greatest threat to a sustainable future and meat consumption is one of the biggest contributors to global warming. This research analyses if the adoption of a multicomponent green nudging approach, consisting of labels, social norms and a marketing campaign, could reduce meat consumption and lead students and staff towards healthier and more sustainable eating habits. Moreover, the participants are classified in Hedonistic, Modern Reflexive and Holistic consumers and the different effects of the nudges on these three consumer segments are underlined. The results showed that the green nudge intervention, caused an increase in meat consumption instead of a decrease and that this effect did not change according to the consumer typology. The meat consumption in general however, was higher for male and young people. Also the consumer typologies Modern Reflexive and Holistic eat generally significantly less meat than the Hedonistic consumers. This study suggests that understanding consumer typologies is very important to understand food consumption habits and that managers should be aware of the fact that “being green” requires more time and spaces in people’s lives and therefore, they should promote ethical and sustainable goods with clear, transparent and personalized communication to help consumers in their buying decision and prevent the confusion that is often associated to green products.

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1. Introduction

“A one percent reduction in world-wide meat intake has the same benefit as a three trillion-dollar investment in solar energy.” ~ Chris Mentzel, CEO of Clean Energy

Global warming is the greatest threat to a sustainable future and it is not only how we heat our homes or how we choose to travel that determines our carbon footprint. Our eating habits have a big impact on climate. There has been a visible change in the world’s population diet habits: the global meat consumption has quadrupled since 1961.¹ This change is leading to serious environmental consequences. Meat products are, in fact, among the most energy-intensive and ecologically burdensome products to produce. Livestock production contributes about 18% to greenhouse gas emissions that lead to climate change, according to the United Nations Food and Agriculture Organization (FAO). Thus, reducing meat consumption in our society seems to be an effective solution to fight climate change.

Researchers have provided evidence showing that widespread adoption of vegetarian diets would cut food-related emissions by 63% (Springmann et al., 2016), and reduce climate change, pollution and water waste (Carlsson-Kanyama and Gonzales, 2009). Becoming a vegetarian is statistically the simplest and cheapest way to reduce human impact on the environment.² Our collectively food choices, in fact, have a huge impact on the climate crisis and the environmental degradation. Meat consumption is driven by a number of psychological factors, including self-image, social norms and habits (Baranowski et al., 1999.) and behavioural insights can be applied to encourage people to reduce it. The ecosystem in which we live provides natural services for humans and all other species that are essential to our health, quality of life and survival. Achieving sustainable societies is, therefore, a critical factor today and that is why many institutions address the concern of how we can feed the world population promoting healthy habits and without threatening the world’s natural resources.

This study implements knowledge from Behavioural Economics and Marketing and applies behavioural nudges in a food consumption setting at the Erasmus University Rotterdam. College time is the best one to implement healthy and sustainable eating habits since it represents the time when people leave their comfortable family environment and create their own eating habits. Moreover, the college student

¹ *Eat less meat for the environment...and for your health!* (2014, April 28). Retrieved from <http://iciscenter.org/our-love-of-meat-is-simply-unsustainable/>

² Vidal, J. (2010). *10 ways vegetarianism can help save the planet*. Retrieved from The Guardian: <https://www.theguardian.com/lifeandstyle/2010/jul/18/vegetarianism-save-planet-environment>

market is currently influencing the expansion of university food services because of their high spending power (Kim and Kim, 2009). Some research has been made concerning the use of behavioural economics and psychology to promote healthy eating, and nudges are a type of intervention commonly designed within this field. However, not much has been done yet concerning nudging college students into adopting healthy and sustainable eating habits, especially in the Netherlands. In order to differ from the previous researches, we tested a multicomponent green nudge intervention at the university canteen. This multicomponent intervention takes two concepts adapted from Schubert's (2016)³ "green nudge framework", labelling food according to the CO_2 emissions and social norms and we added an informative marketing campaign. Moreover, this research classifies consumers according to their eating habits and attitude toward food in Hedonistic (Hausmann, 2000), Modern reflexive (Dupuis, 2000) and Holistic consumers (Katloft, 2001) and the different effect of the green nudge intervention on the three categories are underlined. My research question is the following: Is a multicomponent green nudging intervention that consists of labelling, social norms and a marketing campaign effective in reducing meat consumption with regard to differences in consumers' typology? The research question was analysed through experimental methods, to directly observe consumer behaviour and to control for the conditions under which the decisions are taken.

This paper contributes to the area of food related decisions and nudging. The findings of my research could be useful for public policy and marketing recommendation for stimulating sustainable food consumption. My recommendations could be used for implementing sustainable food policy at campus of universities, since they should be an ethical and professional example for the society. The behavioural cues used in my experiment could be applied not only in college cafeterias, but also in hospitals or company's canteens, restaurants, bars and supermarkets as a useful tool for helping decision makers to improve their health, welfare, and happiness (and that of the environment around them). Moreover, using social norms and labels, supermarkets can increase the sales of sustainable products. Furthermore, the approach we used in the development of the marketing campaign could be used by managers to promote ethical goods.

The remainder of this thesis is organized as follows. Next section presents the conceptual framework and reviews the literature. Section 3 elaborated on the methodology. Section 4 explains the data and the data collection process. Section 5 illustrates the results. Section 6, 7 and 8 focus on the discussion, limitations and managerial implications of the thesis and Section 9 presents the conclusion of the research.

³ Schubert, C. (2016). Green Nudges: do they work? Are they ethical? (working paper Number 09-2016). Retrieved from University of Malburg website: http://www.uni-marburg.de/fb02/makro/forschung/magkspapers/index_html%28magks%29

2. Literature review

This section illustrates the conceptual framework of the thesis. For each variable, we described the previous literatures and drawn a conclusion with the research hypothesis.

2.1 Conceptual Framework

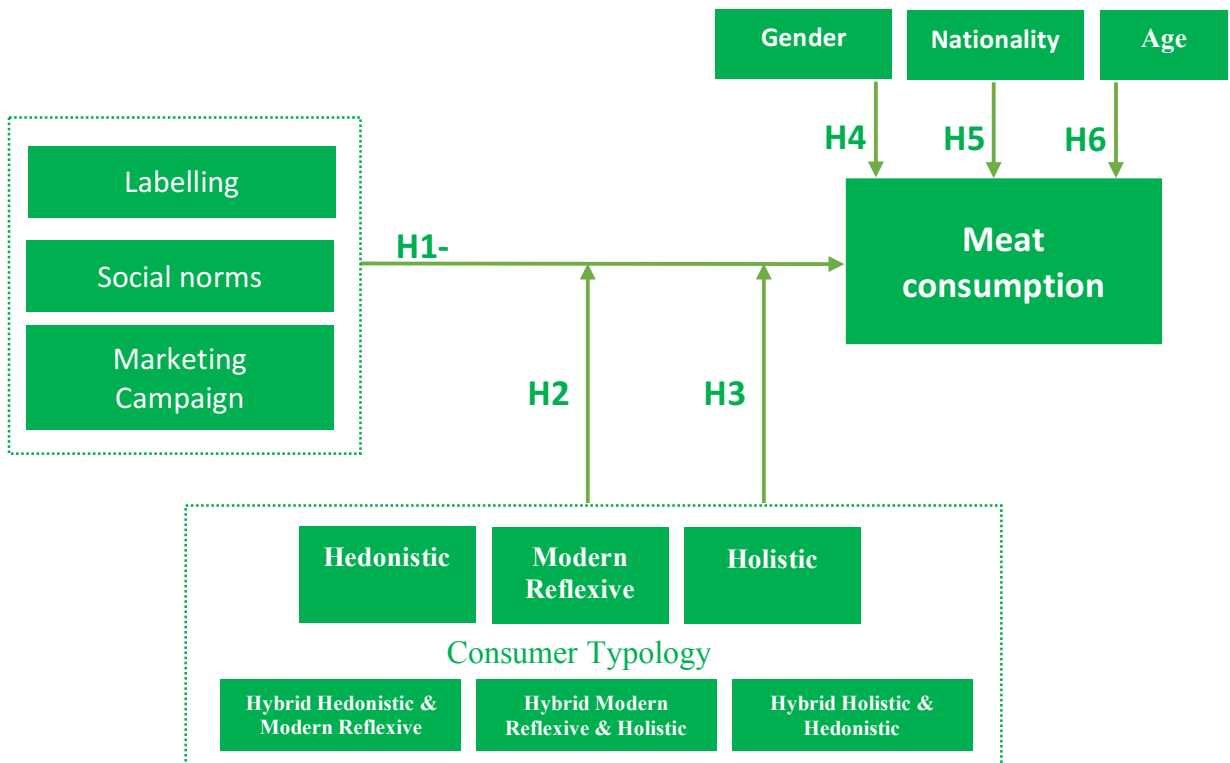


Figure 1: Conceptual model

The implementation of a green nudge intervention, which consists of two behavioural cues, labelling and social norm, and a marketing campaign is supposed to decrease the meat consumption at the university canteen (H1). The consumer typology moderates the relationship between the dependent and the independent variable. The effect of social norms, eco-labels and the marketing campaign on the reduction of meat consumption is supposed to be higher for Modern Reflexive (H2) and Holistic (H3) consumers than for Hedonistic consumers. Gender, nationality and age are inserted in the model as control variables because they influence the eating habits.

The two nudges of the multicomponent green nudge intervention and the marketing campaign are placed in the graphical overview outlining the conceptual model as independent variables. They are adopted from Shubert's (2016) framework and are assumed to be relevant to decrease meat consumption, the dependent variable of the model. We added marketing campaign as a third intervention to make this study more

relevant for marketers and to activate consumers' System 2 that is supposed to lead to habit formation. The moderating variable, consumer typology, influences the effect of the independent variables on the dependent variable. The control variables gender, nationalities and age are also important factors to understand food consumption behaviours.

2.2 Meat consumption and sustainable food

The dependent variable, meat consumption is a dummy variable (0= meat consumption, 1 = no-meat consumption). It has been already demonstrated that the consumption of meat has a negative effect on the environment. More than 18% of the greenhouse gas emissions that lead to climate change are produced by livestock production according to FAO and living on an animal-products-based diet is much less resource-efficient than cultivating grains and legumes for human consumption. Four million people, in fact, would be less hungry if crops fed to livestock were given to people.⁴ Moreover, the production of grains, as soya, meant to feed the livestock we eat, is taking over our rainforest land, which in turn leads to the aggravation of climate change.⁵ The Institute for environmental studies of the Free University of Amsterdam calculated that if every Dutch citizen doesn't eat meat for just one day a week, it would have the same environmental impact as taking 1 million cars off the road.⁶ Furthermore, a vegetarian diet could improve people health, by reducing the risk of diabetes and heart disease and decrease millions of premature deaths.⁷ However, the consumption of meat of the world population is increasing - animal products make up to 20% of the human diet on average around the world.⁸ Meat consumption is driven by a number of psychological factor, including self-image, social norms and habits (Baranowski et al., 1999.) and therefore the application of behavioural insights, such as labels and social norms, in college cafeteria can encourage students and staff to reduce it. Universities should be an example, both ethically and professionally for the society and implementing sustainable food policy to reduce meat consumption at campus can lead the population and other organisations to do the same in their households.

When discussing sustainability of food consumption, it is important to have a clear understanding of the concepts of "sustainable food" and "food consumption". Even if

⁴ "10 shocking environmental facts about meat." Retrieved from <http://www.onegreenplanet.org/environment/shocking-environment-facts-about-meat/>

⁵ King, R. (2011). *Global food crisis: The challenge of changing diets*. Retrieved from The Guardian: <http://www.theguardian.com/global-development/poverty-matters/2011/jun/01/global-food-crisis-changing-diets>

⁶ "Should we give up the car or our steak?", Institute for Environmental Studies, Free University of Amsterdam. Retrieved from: <http://www.ngpf.nl/en/2007/12/17/article-should-we-give-up-the-car-or-our-steak/>

⁷ "Becoming a vegetarian". Retrieved from <http://www.health.harvard.edu/staying-healthy/becoming-a-vegetarian>

⁸ Orford, S. (2015, June 02). *Current meat eating habits not environmentally sustainable*. Retrieved from Metro News: <http://www.metronews.ca/views/the-science/2015/06/02/current-meat-eating-habits-not-environmentally-sustainable.html>

there is no legal definition of “sustainable food”, the main features are well understood and some of its aspects are clearly defined terms, such as Fairtrade or organic. Pothukuchi and Jufman (1999) defined sustainable food as a food that provides social benefits by being healthy, safe and accessible to all members of society. Sustainable food also supports local economies and represents an economic generator for farmers, whole communities and regions. It is environmental beneficial, energy efficient and protects the biodiversity of plants and animals and the welfare of farmed and wild species. Finally, sustainable food avoids damaging or wasting natural resources or contributing to climate change.

Food represents an intersection between the collective and the individual. “Food consumption” has to be considered, in fact, not only with an individual utilitarian approach but as a form of social action, a practice that happens within social institutions like the family, work, and the marketplace (Kjærnes, 2010). Social patterns of behaviour related to food consumption and provisioning emerge from social structure, norms, conventions and situation in which consumption takes place. In food related policy, consumers are seen as responsible, through their “informed choices”, for many societal issues: food quality, health, animal welfare and environmental sustainability (Reisch, 2004).

2.3 The Green-Action Gap

Over the last two decades, consumers have become more aware of the declining state of the environment and thus more concerned about environmental issues. However, the majority of people remain inactive with respect to environmental protective behaviours, as we saw during our experiment. Despite the growing interest in sustainability, in fact, few consumers are willing to actually take the steps necessary to make major changes to their lifestyle, showing a green-action gap.⁹ Consumers are also more demanding from the corporate sector than they are of themselves. They present a lot of aspirational commitment but less real commitment. In fact, people are open to practical environmental ideas that they can implement with as little pain as possible, such as changing their lightbulbs, but less open to ideas that require more effort, such as changing their lifestyle and behaviours.¹⁰ Moreover, “being green” requires more time and space in peoples’ lives, that is not available in increasingly busy lifestyles, and the adoption of sustainable lifestyles is often perceived to be correlated to an increasingly complex decision-making process (Young et al., 2010).

⁹ Kuneva, M. (2009). Consumers want to make green choices. Retrieved from The Guardian: <https://www.theguardian.com/commentisfree/cif-green/2009/nov/29/climate-change-european-commission>

¹⁰ Dolliver, M. (2008). Deflating a Myth. Retrieved from <http://www.adweek.com/brand-marketing/deflating-myth-95690/>

The inclusion of environmentally friendly features and attributes as persuasive selling point for products, known as the Green Advertising, is becoming increasingly important. In fact, a sizable number of consumers reported a willingness to buy green products (French and Showers 2008) and a growing number of marketers are eager to distinguish their products and services as green (Hartmann and Apaolaza-Ibanez 2009, 2010; Iyer and Banerjee 1993; McEachern and Warnaby 2004). Marketers therefore recognize a potential in promoting their products and services as green (Lacy et al. 2010), but many consumers are still unconvinced about the truthfulness of green claims and about the meaningful environmental improvements that green products offer over non-green products (Bonini et al., 2008; Kalafatis and Pollard 1999; Peattie 2010). Consumers' desire to make sustainable purchases is, in fact, sometimes restrained by what many perceive to be a lack of credibility and honesty in advertising in general and in environmental claims in particular (Crane, 2000). Companies face, therefore, a problem of trust. 58% of Europeans, in fact, believe that green labels are used only to charge higher prices.¹¹ Moreover, when consumers do not trust the content of the marketing claims or suspect an advertising message of deception or "greenwashing," they are much less likely to purchase the product or adopt a favourable attitude toward it (Kangun, Carlson, and Grove 1991; Thøgersen 2002) and they can also show a defensive response and acting exactly in the opposite direction of what is suggested through the green campaign.

2.4 Behavioural cues: Labelling and Social Norms

We often believe that we think and choose unfailingly well, we believe to be Homo Economicus (Thaler and Sunstein, 2008). This is the view of the simple rational-choice model. However, research in the field of behavioural economics have shown that humans are not rational robots who make decisions based on the maximization of personal profit.¹² This is especially critical in our current food environment where junk food is highly available, strongly marketed and much cheaper when compared to other healthier and more sustainable meals.

Human behaviour is, in fact, influenced by *biases*, which affects the way people think in uncertain environments, and *heuristics*, which are simplifications used to process complex information (Fox, 2015). Due to biases and heuristics people often fail at sticking to their planning and they often optimistically think they will be able to carry out their future goals. People, in fact, are often misled to think that on the next day they will be able to change their deeply rooted eating habits, which they might have not been able to accomplish "today". Assuming that people do acknowledge

¹¹ Kuneva, M. (2009). Consumers want to make green choices. Retrived from The Guardian: <https://www.theguardian.com/commentisfree/cif-green/2009/nov/29/climate-change-european-commission>

¹² Ariely, D. *How to turn consumers green*. Retrived from <http://voices.mckinseysociety.com/how-to-turn-consumers-green/>

what good behaviour for them should be, a delicate nudge in a certain direction can make them stick to their decisions. Nudges adapt the decision-making context or choice architecture in order to “alter people’s behaviour in a predictable way without forbidding any options or significantly changing their economic incentives” (Thaler and Sustein, 2008, p.6). Therefore, nudges should be viewed as a useful tool for helping decision makers to improve their health, welfare, and happiness (and that of the environment around them).

Nowadays, people think more and more in terms of sustainability and sustainable thinking is a practise that individuals and organization are starting to adopt. However, it is important to underline the previously mentioned “attitude–behaviour gap” or “values–action gap”. For example, 30% of UK consumers report that they are very concerned about environmental issues¹³, but they struggle to translate this concern into green purchases. Hughner et al. (2007) show evidence of this gap. In fact, in their research they found out that, despite generally favourable attitudes that consumers hold for organic food (between 46% and 67% of the population), actual purchase behaviour forms only 4–10% of different product ranges. Moreover, further researches show that the market share for ethical food has remained at 5% of total food sales for the last 3 years.¹⁴ Often consumers justify pursuing their more selfish goals instead of purchasing more sustainable products (this research is looking specifically at fair-trade products) by using neutralization techniques (Chatzidakis *et al.*, 2007). Neutralisation can be described as a mechanism that facilitates norm violating behaviour or actions in contravention of expressed attitudes and restores equilibrium without attitude change. In fact, when social norms are not internalised to the degree that they guide under all circumstances, people start developing coping strategies to deal with the dissonances between their behaviour and the norms. An ulterior explanation of the “attitude–behaviour gap” could be the relative cognitive effort required in buying a product based on sustainable values (Biel and Dahlstrand, 2005). Therefore, changing the environment in which decisions are taken can help consumers to overcome this gap and move towards a more sustainable behaviour.

The three independent variables are also dummy variables and represents the nudges that are supposed to reduce meat consumption. In general, visibility, attractiveness, convenience and the feeling that the food choice fits the norm are the factors that encourages consumers’ choices (Wansink, 2006; Wansink & Cheney, 2005). Behavioural economics and marketing theories can suggest better approaches

¹³ Defra. (2006). *Sustainable Consumption and Production: Encouraging Sustainable Consumption*. Retrieved from <http://www.sustainabledevelopment.gov.uk/what/priority/consumption-production/consumption.html> [1 November 2006].

¹⁴ Co-operative Bank. (2007). *Ethical Consumerism Report 2007*. Retrieved from <http://www.goodwithmoney.co.uk/servlet/Satellite/1200903577501,CFSweb/Page/GoodWithMoney> [25 June 2008].

to conveying information to influence consumers' food choices. Kahnemann (2011), illustrates the powerful tool of framing, that is, the mode of presentation of information, and the amount of information presented. Eco labels are a common nudge based on this principle that aims at capitalize on consumers' desire to maintain an attractive self-image through environmentally friendly behaviour by making certain product characteristics more salient. When consumers act as decision makers, in fact, they do not buy goods only to satisfy their personal individualistic needs, but also with the aim of establishing and maintaining social relationships (Douglas and Isherwood, 1979) and other social functions such as status-seeking (e.g. Veblen, 1899; Leibenstein, 1950; Nelissen and Meijers, 2011). Due to the saliency bias, individuals tend to focus on information or items that are prominent or salient and ignore those who are less visible (Kahneman et al. 1982, Bordalo et al. 2012, Allcott and Wozny 2013). Thus, information that is visual salient is detected early in the visual system, driving bottom-up attention and directly affecting consumers' choices (Ramsøy, 2015). Providing nutritional information is the most common public policy approach used to influence consumer food choices. However, nutrition labels are often viewed as a health barrier because they require high literacy and numeracy skills and resources to engage in consistent healthy behaviours (Rothman et al., 2006; Easton et al., 2010). Given the numerous food choices made daily, acquiring, recalling, and applying nutrition information, while also taking into account individual nutritional needs and preferences can be perceived as an excessively difficult task to many consumers (Wansink, 2006). Hence, it is very important to use food labelling systems that can be easily understood by all consumers and translated into everyday shopping, cooking, and eating behavior (Carbone and Zoellner, 2012; Nielsen-Bohlman et al., 2004). An effective food labelling system has, therefore, the potential to help consumers to adopt healthier and more sustainable eating habits and would benefit not only individuals, but also organizations and society.

Highlighting social norms around meat consumption to exploit people's inclination to imitate the behaviour of their peers is another common practice in food consumption settings. According to Festinger's (1954) social comparison theory, in fact, people often evaluate themselves by comparing themselves to others, especially to others with whom they share similar personal characteristics. Thus, consumers' behaviour is highly influenced by the social groups to which each individual belongs (Merton and Rossi, 1949), and buying decisions are often taken by consumers to differentiate themselves from others or to signal others that they belong to a certain group (Csikszentmihalyi and Rochberg-Halton, 1981). Social influence is defined as "*change in an individual's attitude or behaviour that results from the interaction with other individuals or social group*" (Rashotte, 2007). Social influence affects consumers' behaviour in two ways: through the concept of herd behaviour and the concept of social learning. Herd behaviour arises when individuals imitate other individuals and

base their actions on the observed actions of others (Banerjee, 1992; Bikhchandani et al. 1998). In this situation consumers assume that their peers act rationally and take decision based on better information and therefore they imitate their behaviour, avoiding costly and time consuming information processing (Celem and Kariv, 2004). In other cases, individuals imitate the behaviour of other because they feel part of the same reference group (Park and Lessing, 1977). This implies also that people's choices may differ from the ones they would have made in isolation. In our experiment, we can suppose that herding behaviour will arise because students and staff feel themselves in the same reference group and, therefore, are more willing to imitate others behaviour that will be underlined through social norms. The second dimension of social influence is social learning and it assumes that people are influenced and learn from their social environment (observational learning) and from psychological factors (cognitive learning) (Bandura, 1977).

Some experiments have been made in the USA concerning the canteens "design", reorganizing food disposition and containers in order to make them more appealing and convenient (Chapman et al., 2012; Hanks et al.,2013) and setting meat-free meal options as a default options (Arvai et al., 2012; Wootan, 2012) and both the experiments have shown to be efficient in changing students' choices. In the cafeteria of Massachusetts General Hospital (MGH) in Boston, an experiment showed that traffic light food labels (red-unhealthy, yellow-less healthy, or green-healthy) prompted individuals to consider their health and to make healthier choices at point-of-purchase (Sonnenberg et al., 2013).

In the Netherlands, an experiment has been conducted to analyse the effect of the social influence, that peer groups like colleagues, family and friends exert, in the decision to choose for environmentally friendly products rather than conventional ones (Salazar et al., 2012). This study demonstrated that there is evidence supporting the influence of specific social groups on the buying behaviour of sustainable products.

According to the experiment of Salazar (2012) on social norms and the experiment of Sonnenberg (2013) on eco-labels, the first hypothesis of my research will be the following:

H1a: "The average meat consumption is lower after nudging consumers with eco-labels and social norms behavioural cues."

2.5 Marketing campaign

As society becomes more concern with the natural environment, marketers have started to integrate this concern into the practice and principles of marketing and to develop the concept of "green marketing". Green marketing refers to the advertising

and promotion of environmental-friendly products but also more broadly to all activities that satisfy human needs or wants with minimal detrimental impact on the natural environment (Polonsky, 1994).

Recent researches show that consumers are always more interested in sustainable, ethical and socially conscious products (Cotte and Trudel, 2009). However, due to the “attitude-behaviour gap” the market share of ethical products are relatively small. A problem often faced by marketers is how to motivate consumers to choose for products positioned on the basis of their ethical attributes over those positioned on self-benefit oriented attributes, such as price and performance. Moreover, consumer support for ethical products is not uniformly positive. (Auger and Devinney 2007; Luchs et al. 2010; White, MacDonnell, and Ellard 2012).

A large body of research have been conducted to discover how marketers can encourage consumers to choose for ethical products. Many consumers often associate uncertainty with the purchase of an ethical products because they feel a trade-off between the ethical attributes and the self-benefit attributes (Auger et al. 2008). However, uncertainty about ethical products benefits can be mitigated by using guarantees. (Luchs et al. 2010). When the purchase results in a positive portrayal of their self-image to others, consumers are more likely to engage in prosocial and ethical behaviour (e.g., Griskevicius, Tybur, and Van den Bergh 2010; White and Peloza 2009). Yet actual behaviour of consumers often is not consistent with their personally held standard. Peloza et al. (2013) referred to consumer’s desire to live in line with personally held standards as “self-accountability” and suggested that consumers will prefer products promoted through ethical attributes over those promoted through other types of benefits in situations in which self-accountability is intense. Self-accountability will also activate anticipated guilt associated with the purchase of the less ethical option. However, the sentiment of guilt has to be subtly activated and the campaign needs to be positive because the use of an explicit guilt appeal can lead to a lower preference for ethical products when self-accountability is activated (Pelonza et al., 2013). According to the self-consistency theory (Thibodeau and Aronson, 1992), people are motivated to shape their attitudes and behaviour to be consistent to their personally held-standard when they feel that their actions are inconsistent to these standard. Another research demonstrated also that consumers’ willingness to support ethical products is higher under condition of high need and high justice restoration potential, namely when they believe that they can actually have an impact on the observed injustice through the purchase of ethical products (White et al. 2012).

An informative marketing campaign can help bringing people’s attention to the nudge involving System 2 that will lead to habit formation. In fact, if the choice architecture that nudged the change in the first place is removed, it is unlikely the new habit will be maintained. Thus nudge intervention may result in short-term benefits,

but it is far more valuable to promote lifelong healthy and sustainable eating behaviours: in other words, create new habits. Habits emerge because the brain is adapted by evolution to conserve energy and it is, therefore, constantly looking for ways to save effort. When a habit emerges, patterns unfold automatically because the brain stops fully participating in decision making. In fact, Duhigg (2012) has demonstrated that once someone creates a new pattern, going for a jog or eating a salad instead of junk food, becomes as automatic as any other habit. Habits are at the root of how we behave. We might not remember the experiences that create our habits, but once they are embed within our brains they influence how we act, often without our realization (Duhigg, 2012). In order for this to happen, the nudge has to involve also System 2 (Kahnemann, 2011), that means some cognitive processing of this new behaviour and a conscious decision-making process. This may be accomplished simply by calling people's attention to the nudge in order to make them understand the value behind this change of behaviour and develop and intrinsic motivation to change. By doing so they will set themselves a goal and System 2 will be then engaged.

According to the self-consistency theory (Thibodeau and Aronson, 1992) and the finding of Pelonza et al. (2013) we can hypothesize that by seeing the campaign consumer's self-accountability will be activated and that will lead them to close the gap between their attitudes and behaviours, choosing for sustainable products. Information strategies, such as this marketing campaign, are effective in communicating information but often are not enough to compete with preferences for taste, convenience, and other food attributes. However, in a research about healthy snacking it has been demonstrated that the combination of educational message and a behavioural incentive was more effective in encouraging children to consume healthier snacks, such as fruits instead of cookies. The combination of information and behavioural cues has demonstrated also to be more efficient than applying the two interventions separately (List and Savikhin, 2012). Moreover, as previously mentioned, the effect of the two combined approach, presents more long-term benefits for dietary improvements that tend also to persist after the experiment, since both System 1 and 2 are involved. Thus, we can reformulate hypothesis 1 as follow:

H1b: "The average meat consumption is lower after nudging consumers with eco-labels and social norm behavioural cues and by activating their self-accountability through a marketing campaign with ethical appeal.

2.6 Consumer typology

Many companies acknowledge the importance of understanding consumers when building their marketing strategy. The consumers' classification that we propose in this research could be useful to understand better consumer's needs, their decision making processes and provides a better focus to marketing strategies (Croft, 1994). Lifestyle research was initially introduced to consumer research by Lazer in 1963 (Grunert et al., 1997) while food-related lifestyle research originated in the early 1990s with the aim of obtaining life values by characterising consumers according to their eating habits (Bech-Larsen, Nielsen, Grunert and Sorensen, 1996).

The nominal variables "Consumer typology" represents the moderator variable. Its effect is characterized statistically as an interaction, a categorical variable (Hedonistic consumer, Modern reflexive consumer, Holistic consumer) that affects the direction and/or strength of the relation between the dependent and the independent variables. This research wants to investigate, as a second step, if labels, social norms and the marketing campaign play a different role for the 3 different types of consumers.

However, a new phenomenon in consumer behaviour that can have potentially significant implications for marketing is the emergence of the "hybrid consumer". Hybrid consumers are those that do not fit into any particular market segment as defined in traditional marketing literature (Handelshögskolan, 2009). In this scenario we have three different typologies of hybrid consumers. The hybrid Hedonistic and Modern Reflexive consumers act sometimes irrational and according to their appetite and sometimes guided by their logical reasoning. The hybrid Modern Reflexive and Holistic consumers are those who feel a strong connection with nature but are guided by their logical reasoning and not by their feelings and intuitions. Lastly, the hybrid Holistic and Hedonistic consumers are those who respect nature and therefore like to eat seasonally bounded and mostly vegetarian or vegan but sometimes their appetite takes over and they become irrational.

Consumer typology	Description
Hedonistic Consumers	Taste is a critical factor in deciding on a meal and the ingredients that it contain.
Modern Reflexive Consumers	Guided by logic reasoning and like to choose Fairtrade, organic or locally farmed products.

Holistic Consumers	Make decisions based on feelings and intuition, feel a strong connection with nature and eat mostly vegetarian or vegan options.
Hybrid Consumers	Hybrid Hedonistic – Modern Reflexive, Hybrid Modern Reflexive – Holistic, Hybrid Holistic - Hedonistic

Figure 2: Consumer typology

Sustainable consumption is based on a decision-making process that takes the consumer's social responsibility into account in addition to individual needs and wants (Meulenberg, 2003). As previously mentioned public information is insufficient to drive behavioural changes (Sunstein, 2013). However, more personalized communication techniques, that emphasize consumers' segmentation on the base of relevant characteristics and interests, have been proved to be more efficient (Andreasen, 1995). Personalized messages, in fact, can be more persuasive and can link the recommended behaviour to the perceived wants and needs of the individuals through the best communication channel for that segment (Andreasen, 1995; Grier & Bryant, 2005; Wansink and Cheney, 2005).

Hedonic consumption refers to consumer's multi-sensory images, fantasies and emotional arousal in using products (Hirschman, Holbrook, 1982) and is conceptualised as the ability to experience pleasure in life (Chapman et al., 1976). If people experience pleasure in food or red meat consumption, they will develop positive attitudes towards food or red meat. On the other hand, people with low food hedonism will produce less positive attitudes towards meat sensory characteristics (Audebert et al., 2006). To satisfy their hedonic desires, such as fun, novelty and surprise, hedonistic consumers tend to have an impulse buying behaviour, driven by irrational decision making (Hausmann, 2000). In food consuming behaviour hedonistic consumers are described as those who value taste and ingredients as critical factor in deciding on a meal and like to explore 'exotic' food and to taste as many flavours as possible to satisfy their need for novelty and fun (Johnston & Baumann, 2007; Fischler, 1988; Lockie et al., 2002; Clarke et al., 2008). In order to attract them towards a more sustainable and healthy diet than, the sustainable food has to be tastier than the other options because for them favourable effects on the environment are only a circumstance. However, since they are driven by irrational decision making, the two nudges, labelling and social norms, which are directed towards System 1, can influence hedonic consumers' choices.

An important driver for change with respect to sustainability concerns, is the tendency towards reflexivity within the modern society. The reflexive consumer (Giddens, 1991) makes his own individualized risk assessment and reflects upon

existing cultural norms (Dupuis, 2000). Dupuis (2000) argues that food is a particularly important focus for reflexive consumers, since food consumption is a negotiation about what a person will, and will not, let into his or her body. Modern reflexive consumers are described as people guided by logic reasoning and, therefore, System 2 and who thinks a lot about the effects that consumer behaviour has on the environment, animal wellbeing and producers (Honkanen et al., 2006; Lockie et al., 2000; Beck, 1992; Giddens 1991,1994). For a modern reflexive consumer is important to make a positive contribution to the world and that is why he/she shops in a conscious way, choosing Fair Trade, organic or locally farmed vegetables from small producers (Lockie et al., 2000, 2002; Verdonk, 2009). For these reasons, we assume that the ethical informative marketing campaign will be particularly effective for this kind of consumers.

H2: “The effect of social norms, eco-labels and the marketing campaign on the reduction of meat consumption is higher for Modern Reflexive consumers than for Hedonistic consumers.”

The world holistic is defined in the Cambridge Dictionary as *“dealing with or treating the whole of something or someone and not just a part.”*

The holistic approach to health and diet takes the whole person into account including mind, body, spirit and social interaction to determine the best option.

The holistic consumer is defined as a person who typical takes decisions following System 1, based on feelings and intuition, and who feels a strong connection with nature and therefore likes to eat seasonally bounded and mostly vegetarian or vegan options (Schösler et al., 2013; Katloft, 2001). Health is very important for the holistic consumers and he/she believes that “good to yourself also means being good to the world around you” and that the food contributes to our mental and physical health (Baggini, 2014; Schösler et al., 2013). According to this theory, choosing healthy and more sustainable food for holistic consumers will be natural and implementing some nudges to remind them the path they imposed themselves to follow, will help reducing the “attitude-behaviour gap”.

H3: “The effect of social norms, eco-labels and the marketing campaign on the reduction of meat consumption is higher for Holistic consumers than for Modern Reflexive consumers.”

2.7 Meat consumption by gender, nationality and age

Gender, nationality and age have a strong influence on meat consumption, therefore they are inserted in the analysis as control variables. Moreover, gender, nationality and age variables are frequently recognized as important factors for understanding behaviours related to the environment (Dietz et al. 1995; Dietz, Kalof and Stern 2002).

In general, women consume substantially less total meat than men (74 grams a day less), they also consume less beef (almost 17 grams a day less), which is often considered a “powerful” and masculine food (Adams 1990; Bourdieu 1984). From Adam (1990) and Bourdieu (1984) analysis we derived our fourth hypothesis.

H4: “The meat consumption is generally higher for men than for women.”

Also nationality shape many health behaviours, such as dietary patterns and therefore it is highly correlated with meat consumption (Sorensen et al., 2007). On average, the consumption of meat all around the world consists of 34 kg per person each year according to the Organisation for Economic Cooperation and Development.¹⁵ However, this consumption is not equally spread around the world. This difference is caused by many factors, such as the high cost of meat, that makes difficult for people in the developing countries to have access at it. Also cultural norms play an important role, for example, in India the majority of the population is Hindu and therefore being vegetarian is very common. North American, South American and Australian (inserted in the “Others” category in our analysis) are those who consume more meat per capita. Asian and African, instead eat in general less meat.¹⁶ In Europe, the countries with a Mediterranean Diet, such as Italy, Greece, Spain, Portugal, Cyprus and French, consume mainly fruits and vegetables, beans and nuts, healthy grains, olive oil, fish and a small amount of dairy and meat products.¹⁷ Therefore, they are supposed to eat less meat than the other European countries. From these nationality related differences in meat consumption we derived out fifth hypothesis.

H5: “The meat consumption is generally higher for Benelux, American, North-, East-European compared to Asian, African and European from the Mediterranean countries.”

Age is also a determinant of meat consumption. Researchers at the University of Florida showed that as people age, they tend to buy less meat. The reason might be their education. The older people are, the wiser and more educated they are and as

¹⁵ Gould, S., “The countries where people eat most meat.” (2015). Retrived from <http://www.businessinsider.com/where-do-people-eat-the-most-meat-2015-9?IR=T>

¹⁶ “Kings of the Carnivore. Who eats most meat?” (2012). Retrived from <http://www.economist.com/blogs/graphicdetail/2012/04/daily-chart-17>

¹⁷ “History of the mediterranean diet pyramid”. Retrived from <https://oldwayspt.org/history-mediterranean-diet-pyramid>

education level increases people become more environmentally conscious and therefore start to experiment more with different kinds of food. Moreover, elderly people are usually more concern about their health than young people.¹⁸

H6: “The meat consumption is generally higher for young people than for elderly people”.

3. Methods

The majority of studies on sustainable consumption used stated preferences (survey) as method for the data collection. Nevertheless, we decided to follow the approach used by Salazar et al. (2012) and Sonnenberg et al. (2013) and apply experimental methods. A field experiment permits to reveal the disposition of individuals to buy sustainable products rather than question it. The advantages of using an experiment are the reliability, control features and incentive-compatibility (Davis & Holt, 1993). Moreover, an experimental setting allows to control the information presented to consumers and check if individual choices are related to the social environment and the given information.

A 7-question survey will be used to classify consumers. All items in the questionnaire are measured on a seven-point Likert scale ranging from “completely disagree” (1) to “completely agree” (7). To classify consumers in the three categories according to their answers we will follow the approach of De Boer et al. (2004). Three classification functions, as shown in formula 1 (StatSoft, Inc., 2002), will be used to compute classification scores for the new respondents. The respondents will be then classified to the segment for which it has the highest classification score.

$$S = c_i + w_i * x_i + w_{i2} * x_2 + \dots + w_{im} * x_m \text{ (formula 1)}$$

Where:

1. Subscript i denotes the respective segment (*Hedonistic, Modern reflexive, Holistic*);
2. Subscripts $1, 2, \dots, m$ denote the m items in the questionnaire;
3. c_j is a constant for the i th segment;
4. w_{ij} is the weight for the j th variable in the computation of the classification score for the i th segment;
5. x_j is the observed value for the respective respondent for the j th variable;

¹⁸ University Of Florida. (2000, September 28). Who Eats Beef? Consumption Depends On Age, Education, UF Study Shows. *ScienceDaily*. Retrieved June 4, 2017 from <http://www.sciencedaily.com/releases/2000/09/000914104820.htm>

6. S_i is the resultant classification score.

We supposed that all the j th variable were weighted the same, since they were equally mentioned and rated as important in the literatures.

3.1 Setting and Sample

The experiment took place in May over an 8-day span, where the first four days were the control period and the last four days were the intervention period. We didn't take Friday in consideration because in the university canteen on Friday the meal of the day for €3,95 is fish, whereas from Monday to Thursday people can choose between two meal of the day: a vegetarian one and a meat-containing meal both for €3,95, which is roughly US\$4.50. Moreover, we decided to have only 4-day periods because the people that eat at the canteen are always almost the same every day and we thought that the data we would have obtained in a longer period of time would have been only a repetition of the first four days.

To remove selection and confounding effect biases and to respect the casual inference principle we followed the Difference in Differences (DiD) approach of Gertler et al. (2016) and compared behaviour in two identical situations, but where one variable is changed in one situation. Difference in Differences estimates the counterfactual for the change in outcome for a treatment group by calculating the change in outcome for a comparison group. This method allows us to take into account any differences between the treatment and comparison groups that are constant over time.

In order to do so, we gathered data in two different university canteens at the Erasmus University. The students and staff at canteen A¹⁹ represented the comparison group and the people at canteen B²⁰ the treatment group. Thus during the four-day baseline period we had two different control groups in the two different canteens and we measure the meat consumption in both. During the four-day intervention period we had a treatment group in the cafeteria B, where we implemented the nudges and marketing campaign and a comparison group in the canteen A where everything was kept the same. After that, we compared the difference in the meat consumption between the baseline period and intervention period in the canteen A with the one in the canteen B. By doing that we avoided that confounding effects, such as the increase in the meat price, biased our research. We subtracted then the difference obtained in the comparison canteen (D-C) from the one obtained in the canteen with the intervention (B-A) to get the real net effect that the green nudge intervention had on the meat consumption.

¹⁹ We refer to canteen A to describe the canteen "Etude" in H Building of the Erasmus University Rotterdam.

²⁰ We refer to canteen B to describe the canteen "The Company" in T Building of the Erasmus University Rotterdam.

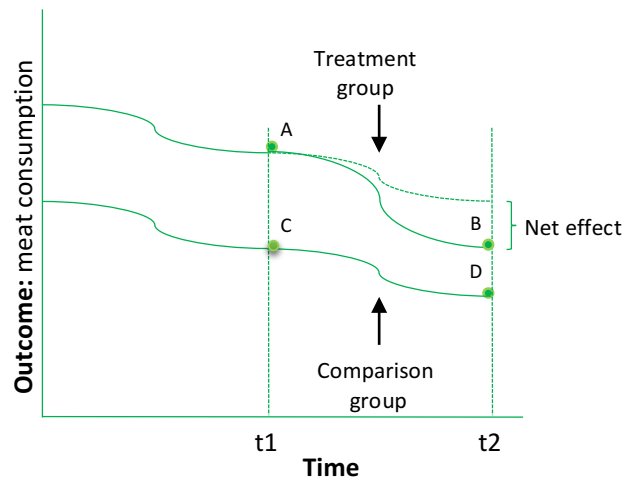


Figure 3: Difference in Differences

The Net effect of the decrease in meat consumption produced only by the multi component green nudged intervention is obtained by subtracting the difference in outcome between period 1 (t1) and period 2 (t2) of the comparison group (D-C) from the difference in outcome of the treatment group (B-A), so that the formula will be $((B-A)-(D-C))$.

The restaurants are open five days a week from 11:00 am to 2:00 pm, completing each an average of around 500/600 transactions per weekday. The experiment was a between-subject design and therefore we had two different groups per canteens: Group 1 served as a control group and Group 2 as treatment group. The participants were students and staff of the Woudenstein campus of EUR.

3.2 Intervention

We implemented two behavioural cues and a marketing campaign in the canteen B. The behavioural cues consisted of a traffic light labelling system to inform students and staff on the healthiness and sustainability of the cafeteria items and social norms to provide data on vegetable consumption. For the first nudge green, orange and red labels were attached on all the different food options according to the CO₂ emissions and a poster with an explanation of the labels was hanged on a wall (Appendix A). The canteen provided the menu to the Sustainable Food Lab and we calculated the relative degree of healthiness and sustainability through the website eaternity.com.

The second nudge, instead, consist on highlighting social norms around meat consumption to exploit people's inclination to imitate the behaviour of their peers. For this nudge posters (Appendix B) and visual materials were hanged on the cafeteria's walls. The statistics and number of students who eat vegetarian every day at the canteen were collected through a survey (Appendix C) that we collected personally by interviewing people in line at the check-out of the university canteen B on a one-week span in April. The number of vegetarian meal consumed per day was calculated as an average of the data collected every day during this week. The obtained result was that 1 out 3 people at the canteen eat vegetarian every day. This

result was confirmed also by the 2016 Report of the National Institute of Public Health and the Environment on Food consumption in the Netherlands. The report stated that the prevalence of vegetarians and vegans in the Netherlands ranges from 2.2% to 4.5% and about 1 in 3 persons is a flexitarian; someone who does not eat meat daily.²¹

As a third intervention to reduce the meat consumption we designed an informative marketing campaign to promote a vegetarian diet based on the study of Pelonza et al. (2013). This marketing campaign presents an informative ethical appeal, that underlines the ethical aspect of a vegetarian diet on the environment, and can be applied also in retails settings to promote ethical goods or in other situations in which customers often encounter ethical appeals in group contexts, such as cafeterias or supermarkets. This intervention aimed at bringing people’s attention to the nudge involving System 2 that will lead to habit formation. The marketing campaign was illustrated on a big size poster at the entrance of the canteen. We manipulated appeal type through perceptual prominence with the use of images, colours, and placement (Gardner 1983), a common practice in contemporary ethical appeals, especially those related to the natural environment (Appendix D). To create the marketing message, we followed the approach of Baack and Clow (2012) by designing a message theme, a message strategy, a marketing appeal and an executional framework. The message theme was the promotion of a vegetarian diet. Since the advertising object is to create awareness and provide information on the benefit of a vegetarian diet on the environment we decided to use a cognitive/informational message strategy providing data in a clear and logical manner (Laskey et al., 1989). For the same reason we preferred a direct, explicit and feature centred hard-sell appeal over a soft-sell appeal to induce rational-thinking (Okazaki et al., 2010). As executional framework we used the slice of life concept, which objective is to offer a solution (vegetarian diet) to common challenges (reduce the Co2 emissions and therefore global warming) that consumers and businesses address (Baack & Clow, 2012).

NUDGE	COGNITIVE BIAS	IMPLEMENTATION
Labelling	Saliency Bias	Highlight environmental consequences of individual food purchasing choices via traffic-light eco-labelling (GREEN, ORANGE, RED).

²¹Food consumption in the Netherlands and its determinants. Background report to ‘What’s on our plate? Safe, healthy and sustainable diets in the Netherlands.’ RIVM Report 2016-0195. Retrieved from <http://www.rivm.nl/dsresource?objectid=25ac7c02-8364-40ec-9f26-9f714ff30ff1&type=pdf&disposition=inline>

Social Norms	Herding Bias	Presenting data on vegetable consumption (“x% of your fellow students chose to eat vegetarian, join them and take a first step to save our planet”).
Marketing Campaign	Activating Self-accountability	Promote a vegetarian diet on a banner hanged at the entrance of the canteen, underlining the benefits of a vegetarian diet for the environment.

Figure 4: Behavioural cues applied in the experiment

3.3 Duration and procedure

The duration of the whole experiment was eight days. We stayed every day at the canteens for a total of 3 hours from 11 am to 14 pm, 1.5 hours at our intervention canteen B and 1.30h hour at the comparison canteen A. During the four-day baseline period we asked the control groups of the two canteens to answer a survey (Appendix E) after making a purchase in order to classify consumers in the three typology previously described and check if they choose a meat or non-meat containing option. After that, during the four-day intervention period, we implemented the nudges in the canteen B and we asked the treatment group there and the comparison group in the canteen A, where nothing changed, to complete the survey after they paid for the lunch and we checked if they selected a meat or a meat-free meal. The interviewers approached customers at one of the four cash registers of the cafeteria. After completing a survey with one customer, the interviewer would approach the next customer who completed a transaction at the next cash register. The survey took approximately 4 minutes to complete.

We decided not to use incentives, because the experiment was a natural field experiment and people have not been invited to have lunch at the canteen but they decided on their own without knowing that an experiment was going on. Moreover, for the survey we took into consideration students’ willingness to help other students and the intrinsic motivation that people may have to answer our survey, due to the interest in discovering themselves better as consumers and know which typology of conscious consumer they are.

3.4 Outcome measurement

To measure the amount of meat consumption we asked in the survey and check personally if consumers selected a meat-free option or not. We compared then the data gathered in the intervention canteen during the baseline period and the intervention period to check if meat consumption decreased and if it changed according to the specific consumer's typology. From this difference we subtracted the difference in outcome obtained in the comparison canteen to avoid confounding factors bias and to get the net effect of the decrease in meat consumption only produced by our multi-component green nudge intervention. To check if the hypotheses are satisfied we made sure to have similar samples in both the treatment and control group.

3.5 Data analysis

To check the hypotheses, we analysed data with a Binary Logistic Regression model and a difference-in-difference study design, since both the dependent and the independent variables are nominal and we wanted to see if the behavioural cues decrease the probability of consuming meat. Even if the Linear Probability Model it is suggested as a best practise for the Difference in Difference experimental design for an immediate interpretation of the coefficient (Gertler et al., 2016), we decided to use a Logit Model to overcome the problem of the unbounded predicted probabilities that might not fall in the range between 0 and 1 (Aldrich and Nelson, 1984). The base regression model was extended with moderators to analyse whether the effects of social norms, eco-labels and the marketing campaign differ from consumer's typology. The consumer typology Hedonistic was left out of the regression because it served as reference category and to avoid multicollinearity. Gender, nationality and age were inserted as control variables since they have both a strong influence on meat consumption.

The regression model was defined as following:

$$Y_{meatconsumption} = \beta_0 + \beta_1 T_i + \beta_2 t_i + \beta_3 T_i t_i + \beta_4 T_i t_i * ModernReflexive + \beta_5 T_i t_i * holistic + \beta_6 T_i t_i * Hedonistic_{ModernReflexive} + \beta_7 T_i t_i * Hedonistic_{Holistic} + \beta_8 T_i t_i * Modernreflexive_{Holistic} + \beta_9 Gender + \beta_{10} Nationality + \beta_{11} Age + \varepsilon$$

Where:

1. T_i is a dummy indicating treatment (0= comparison group; 1= treatment group)
2. t_i is a dummy indicating pre- or posttreatment (0=pre-treatment; 1=post-

- treatment)
3. $\beta_3 T_i t_i$ is the interaction term that represents the Difference-in-Difference
 4. $\beta_4 T_i t_i * ModernReflexive, \dots, \beta_8 T_i t_i * Modernreflexive_Holistic$ are the interaction terms between the Consumer Typologies and the Difference-in-Difference and they represent the moderators
 5. $\beta_9 gender$ is a dummy indicating the gender of the respondents (0= female, 1=male)
 6. $\beta_{10} nationality$ is composed by 11 dummy variables indicating the country of origin of the respondents (Benelux, Asian, American, East_European, Central_European, Eu_Mediterranean, African, Other). Since we did not have had enough observations to create a separate variable for each country, they were grouped into geographical regions with similar eating habits.
 7. $\beta_{11} Age$ is composed by 6 dummy variables indicating the age range of the respondents (16_20, 21_24, 25_30, 31_40, 41_50, 51 or older).

4. Data

4.1 Data collection

For this research, a survey was created to collect primary data. The survey was done in person through the use of tablets in the university canteen. During the data collection period we obtained 680 observations. We interviewed, in fact, 170 people per each of the four samples (Baseline – Canteen A, Baseline-Canteen B, Intervention-Canteen A, Intervention-Canteen B).

4.2 Variables

The depended variable is meat consumption, a dummy variable (0= meat consumption, 1 = no-meat consumption). The independent variables are the period (0= Baseline, 1= Intervention), canteen (0= Canteen A, 1= Canteen B) and the Difference in Difference interaction term, where 1 indicates the intervention period in the treatment canteen (canteen B) and therefore represent our green nudge intervention. Also the moderators and the control variables are dummy.

4.3 Descriptive Statistics

In total, we obtained 348 female observation and 332 males. 601 of the responders were students, 63 were University Staffs 16 externals. The majority of the people interviewed were between 21-24 years old (308 people), 215 people between 16-20

years old, 121 between 25-30 and we also interviewed few people in the categories 31-40, 41-50 and 51 and older. 301 of the responders were Dutch, 58 Germans, 36 Chinese, 30 Italians and few people of other 63 other different nationalities. Due to the different amount of observations in the analysis, the countries were grouped in geographical regions with similar eating habits. Benelux (Dutch, Belgian and Luxembourgish) was the most popular nationality and therefore we use this as reference category.

Table 1: Descriptive Statistics of the analysis sample

	Mean (S.D.)	Min-Max	Freq.	Percent
<i>Meat Consumption</i>	0.60 (0.48)	0-1		
Yes			249	39.56%
No			411	60.44%
<i>Period</i>	0.50 (0.50)	0-1		
Baseline			340	50.00%
Intervention			340	50.00%
<i>Canteen</i>	0.50 (0.50)	0-1		
A			340	50.00%
B			340	50.00%
<i>DiD</i>	0.25 (0.43)	0-1		
No Nudge			510	75.00%
Nudge			170	25.00%
<i>Gender</i>	0.48 (0.50)	0-1		
Female			348	50.00%
Male			332	50.00%
<i>Employment Status</i>				
Student			601	88.38%
University Staff			63	9.26%
External			16	2.35%
<i>Nationality</i>				
Benelux			307	
Asian			91	
American			24	
East European			37	
Central European			91	
North European			12	
Mediterranean Eu			81	
African			15	
<i>Age</i>				
16-20			215	31.62%
21-24			308	45.29%
25-30			121	17.79%
31-40			24	3.53%
41-50			7	1.03%
51 or older			5	0.74%

<i>Consumer Typology</i>		
Hedonistic	108	15.88%
Modern Reflexive	142	20.88%
Holistic	331	48.68%
Hedonistic_Holistic	44	6.47%
Hedonistic_MR	15	2.21%
MR_Holistic	40	5.88%
Observations	680	
Individuals	680	

5. Results

5.1 Consumer Typology Analysis

According to the survey, 331 of the respondents, were categorised as Holistic Consumers, 142 as Modern Reflexive and 108 as Hedonistic. The other 99 were defined as Hybrid Consumers, divided in the categories Hedonistic-Holistic (44), Hedonistic-Modern Reflexive (15) and Modern Reflexive Holistic (40). In total sample we observed 54 vegetarians and only 10 vegans, all classified as Holistic Consumers. These numbers shows that Erasmus University Students and Staff are highly educated people that are concerned about environmental issued. This concern and attitude, however did not translate into pro-environmental behaviour. In fact, 199 of the Holistic Consumers, described as people who feel a strong connection with nature and therefore eat mostly vegetarian or vegan options, eat meat for lunch at the university canteen. It could be the case that people knowing that they were participating in a survey and that we were personally there, were more inclined to give more socially desired answers. This phenomenon is known as Social desirability bias and indicates the tendency of survey respondents give answers, which are favourable viewed by others, to over-repost “good behaviour” and under-report undesirable behaviour (Thompson and Phua, 2005).

5.2 Difference in Difference outcome

In the comparison canteen A, 111 people out of 170 eat meat in the baseline period and 96 people in the intervention period, so actually the meat consumption decreased without implementing any changes in the canteen. In the treatment canteen B, instead, the number of people eating meat rose from 93 in the baseline period to 111 in the intervention period. This actually means that our green nudge intervention caused the opposite desired effect, thus more people eating meat. With the difference in difference analysis, in fact, we calculated that the net effect produced by our

intervention on the meat consumption was 33 more people eating meat.²² However, it could be that other confounding factors affected the meat consumption. Menu changes is one of the most probable. The menu, in fact, was different every day for the two canteens and it differed also between the baseline and the intervention period. It could be for example that people preferred more the vegetarian burger in Canteen A, rather than the beans and lentils stew in Canteen B. Moreover, the last day of the intervention period in the canteen B there was no proper vegetarian meal in the menu, only if people would have asked they would receive a vegetarian dish. This makes more difficult that non-vegetarian would order a vegetarian meal, because this option is not visible on the menu-blackboard and therefore also the green label was not applied and it requires an extra effort for them to ask for this dish. Another reason could be that in the Canteen B intervention period we interviewed more man than in the baseline period (77 Baseline, 99 Intervention), and guys usually eat more meat than girls. However, this happened also in the Canteen A, where the meat consumption decreased and therefore we cannot attribute the increase in meat consumption only to the higher number of male interviewed. It could be also that many people did not notice at all the intervention. The posters were placed at the entrance of the canteen where people took the trays and dishes, but usually the time that people spend there is really short and the posters might go unnoticed. Some people also reported that they were too focused in the food choice and they did not notice the labels. Another reason could be the fact that people felt threatened in their “free choices”. The Self Affirmation Theory states, indeed, that people are motivated to maintain the integrity of the self and they are vigilant to events and information that can compromise it. In these situations, people try to protect and restore their self-integrity by resisting to changes as a defensive response (Sherman and Cohen, 2006).

²² $((B-A) - (D-C)) = ((111-93) - (96-111)) = (18) - (-15) = 33$

5.3 Binary Logistic Regression Model

Table 2: Logistic regression results for testing our 6 hypothesis

<i>Meat Consumption</i> (0=NO, 1=YES)	(1)	(2)	(3)	(4)
<i>Period</i>	-0.093	-0.101**	-0.101**	-0.099***
<i>Canteen</i>	-0.094***	-0.090***	-0.090***	-0.092***
<i>DiD</i>	0.158**	0.171****	0.171**	0.176***
<i>Gender</i>				
Male	0.256*	0.251*	0.251*	0.255*
<i>Nationality</i>				
Benelux	-	-	-	-
Asian	0.232*	0.215*	0.215*	0.222*
American	0.116	0.119	0.119	0.095
East European	-0.002	-0.009	-0.010	-0.007
Central European	-0.081	-0.090***	-0.089	-0.083
North European	-0.129	-0.161	-0.162	-0.146
Mediterranean Eu	0.026	0.024	0.022	0.019
African	0.184	0.184	0.184	0.182
<i>Age</i>				
16-20	-	-	-	-
21-24	-0.704***	-0.061	-0.060	-0.066
25-30	-0.108***	-0.105***	-0.104***	-0.107***
31-40	-0.056	-0.027	-0.024	-0.0421
41-50	-0.348**	-0.369**	-0.371**	-0.345**
51 or older	0.146	0.179	0.179	0.181
<i>Consumer Typology</i>				
Hedonistic		-	0.142**	-
Modern Reflexive		-0.157**	-0.023	-0.107***
Holistic		-0.132**	-	-0.080***
Hedonistic_Holistic		0.673	0.201**	
Hedonistic_MR		-0.127	0.007	
MR_Holistic		-0.256**	-0.122	
DiDhedonistic		-	-0.244	-
DiDmodernreflexive		-0.057	-0.053	-0.062
DiDholistic		-0.141	-	-0.019
DiDhedonistic_mr		/	/	
DiDmr_holistic		0.130	0.134	
DiDhedonistic_holistic		-0.125	-0.121	
Observations	680	680	680	680
Individuals	680	680	680	680
Pseudo R ²	0.0785	0.0965	0.0965	0.0863

Note. **** p -value \leq 0.01, *** p -value \leq 0.05, ** p -value \leq 0.1, * p -value \leq 0.2.

- Left out as baseline category

/Dropped due to the small number of observations

The base regression model is kept relatively small in order to identify the most important effect. Later on the model will be expanded with moderators. The details of the base model and coefficients can be found in Table 2 column 1. The regression model can statistically significantly predict the dependent variable (Wald Chi 2 (19, 680) = 69.50, $p = 0.00$).

Table 2, column 1 shows that the Difference-in Difference coefficient is significant at a 5% significance level ($z = 2.22$, $p = 0.027$), indicating that our intervention had an effect on meat consumption. The DiD coefficient tells us that the probability of eating meat increases by 16% when the green nudge intervention is applied. Therefore, the Hypothesis 1 (H1a, H1b), which stated that the average meat consumption is lower after nudging consumers with eco-labels and social norm behavioural cues and by activating their self-accountability through a marketing campaign with ethical appeal, is not satisfied. The variable gender has a significant effect on the dependent variable ($z = 7.66$, $p = 0.00$), indicating that in general the probability of eating meat is 26% higher for men than for women, confirming our Hypothesis 4 (H4). Not all the nationalities instead affect the meat consumption significantly. Asian is the only category that has a significant effect at 5% significance level ($z = 3.83$, $p = 0.00$), indicating that the probability of eating meat is 23% for Asian compared to people from the Benelux region. Those two coefficients are not in line with our expectations and therefore the Hypothesis 5 (H5) is not satisfied. All the other dummy variables indicating the country of origin of the respondents are not significant both at 5% and 10% significance level. Looking at the control variable Age it can be noticed that only the category 21_24 ($z = -1.66$, $p = 0.097$), 25_30 ($z = -1.90$, $p = 0.058$) and 41_50 ($z = -2.02$, $p = 0.044$) are significant respectively at 10% significance level the first two and at 5% the last category. The coefficients of these three categories indicates that when people age, the probability of eating meat decrease. In fact, the probability of eating meat for people between 21 and 24 years old is 7% lower than people between 16 and 21, for people between 25 and 30 is 11% lower and for people between 41 and 50 years old is 35% lower than the youngest category, confirming out Hypothesis 6 (H6).

Column 2 of Table 2 shows the results of the logistic regression for the model extended with moderators. Looking at the Pseudo- R^2 we can see that this model is an improvement of the previous one and therefore explains the data better Pseudo- $R^2 = 0.0965$). The consumer typology Hedonistic is left out of the model as baseline category. However, when inserting the interaction effects between the intervention and the consumer typologies in the model, the coefficient of the DiD becomes statistically significant only at 20% significance level ($z = 1.46$, $p = 0.144$). This is probably caused by the fact that the interaction effects are highly correlated with the depended variable. In this regression also the variable "Central European" becomes significant at 10% significant level, showing that the probability of eating meat is 8% lower for

central European than from people from Benelux. From the table we can also see that the meat consumption did not change differently with the intervention according to the consumer typologies. All the interaction effects (Didmr_holistic, Didmr, Didholistic, DiDhedonistic_holistic), in fact, are not significant. Therefore, our Hypothesis 2 and 3, on the different effect of the intervention on the meat consumption of Hedonistic, Modern Reflexive and Holistic consumers are also not satisfied. The variable DiDhedonistic_modernreflexive has been dropped because we had only 2 observations, meaning that only two people during our intervention were classified as Hedonistic_Modernreflexive. Independently from the intervention instead, all the consumer typologies, except for Hedonistic_Holistic and Hedonistic_ModernReflexive, have a significant effect on meat consumption. The model shows that, in general, the probability of eating meat decrease by 26% when they are ModernReflexive_Holistic, by 16%, when consumers are Modern Reflexive and by 14% when they are Holistic, in comparison with Hedonistic consumers. These findings are in line with the literatures and confirm our expectations. However, from the literatures we expected that in general the probability of eating meat would have been higher for Modern Reflexive consumer than for Holistic consumer but the results show the opposite. To check that we run another logistic regression (column 3), where we left out the variable "Holistic" as baseline category and this showed that the probability of eating meat for modern reflexive consumers ($z=-0.43$, $p=0.665$) is not statistically different from the one of holistic consumers. In this regression the variable DiD is again significant at 5% significance level ($z=2.01$, $p=0.044$) indicating that the green nudge intervention increases the probability of eating meat by 16% as in the first regression without moderators. This difference could be due to the fact that the baseline category Holistic (331 observations) is much bigger than the category Hedonistic (108 observations).

Column 4 instead show the results of the logistic regression only with the pure consumer typologies. The Hybrid categories: Hedonistic_Modern reflexive, ModernReflexive_Holistic and Hedonistic_Holistic are, in fact, left out to identify the effect of the three most important typologies. In the regression the Difference in Difference is significant at 10% significance level ($z=1.90$, $p=0.058$), indicating that our green nudge intervention caused a 17% increase in the probability of eating meat. Regarding the consumer typologies, it can be noticed that both "Modern Reflexive" and "Holistic" are significant at 10% significance level and their coefficients show that the probability for eating meat is respectively 10% and 8% lower than hedonistic consumers. The interaction terms between the DiD and the consumer typologies are also in this case non statistically significant.

6. Discussion

The results show that nudges can be a powerful tool to affect behaviour, but that they do not always work as expected and many other factors can affect the desired outcome. In this case, in fact, our green nudge intervention, caused an increase in meat consumption instead of a decrease. However, other confounding factors, out of our control, such as menu changes, may have contributed to the rise of meat eaters. This represents an ulterior evidence of the fact that meat consumption is often driven by habits (Baranowski et al., 1999.) and habits are difficult to change because they are shortcuts that help our brain to conserve energy and they seat deeply within us until a new habit takes over, in this case switching meat with plant-based alternatives (Duhigg, 2012). Moreover, an adoption of a sustainable lifestyle is often seen by people as time and energy consuming and correlated to a more complex decision making process (Young et al., 2010). This perception represents one of the biggest obstacle for people to become more sustainable.

The results of the analysis also confirm the Self Affiliation Theory (Sherman and Cohen, 2006), showing that people, in terms of lifestyle and consumption habits are motivated to maintain their self-integrity and to resist to external changes. This could be an ulterior explanation of the increase in meat consumption. It could be, in fact, that people instead of eating less meat they eat more as a defensive response to the nudge intervention. In previous research (Sonnenberg et al., 2013; Salazar et al., 2012) single nudges worked in similar food consumption settings but it could be that a green nudge intervention using different nudges make the attempt to reduce the meat consumption too obvious and evident and, therefore, people feel manipulated.

The results of the survey, instead, show that students and staff at the Erasmus University Rotterdam care about sustainability and the environment. Most of the respondents, in fact, are classified as Holistic consumers. This concern however is not translated into environmental-friendly action conforming the Green-Action-Gap (Hughner et al., 2007). Most of the people (474 out of 680), in fact, reported in the survey that sustainable certifications are important and 316 that sometimes they adhere to a vegetarian or vegan diet because they are aware of the fact that meat production is bad for the environment. However, only 54 people were vegetarians, only 10 vegans and 411 out of 680 eat meat a for lunch at the university canteen during our observation period. Many people, in fact, are still unconvinced about the reliability and credibility of the green claims. In our survey, 176 of the respondents stated indeed that they perceive sustainable certifications as redundant and 262 as confusing.

The analysis of the control variables confirmed our hypothesis 4 and 6, saying that the meat consumption is higher for men than for women and for young people in

comparison to elderly people (from 41 to 51 or older). Only the effect of nationalities on meat consumption did not confirm our hypothesis 5 showing that Asians eat more meat than people living in Benelux, America, North and East Europe. This may be due to the fact that we expected many people coming from India, where most of the population is Hindu and therefore vegetarianism is very common, but looking at the number of the Asian group only 11 people out of 91 were Indians. The majority were instead Chinese and according to OECD and FAO China eats around 28% of the world's meat, including half its pork.²³

Furthermore, the results also support the assumptions that we made based on the literatures on the different consumer typology. Modern reflexive and holistic people, in fact, eats in general less meat than hedonistic consumers because they both think more in terms of sustainability and reflect on their food choices. However, between modern reflexive and holistic consumers we did not notice a big difference in behaviour. The probability of eating meat is slightly lower for modern reflexive (2.3%) than for holistic people, this could be also partly due to the fact that the percentage of female in the modern reflexive group (55%) was higher than the one in the holistic group (49%).

7. Limitations

This research aims at suggesting an approach to stimulate sustainable food consumption among the youngsters by implementing nudges and marketing techniques in college cafeterias, hospitals or company's canteens, restaurants, bars and supermarkets. Nevertheless, the data is sampled from one university canteen only. Generalizing the conclusion over multiple environment, such as other universities, supermarkets or hospitals, therefore, needs to be done with caution.

Moreover, the data from our survey about consumer typologies, cannot be regarded as completely reliable. It is evident, in fact, that the survey is about environmental consciousness and the survey questions can prime people towards environmental-friendly responses. Also the fact, that I was personally there when people answered the survey, could be an ulterior reason for them to give socially desirable answers. It could also be that the respondents did not answer the survey questions attentively because we did not provide any incentives, but we just assumed students' willingness to help other students.

Furthermore, other confounding effects might have affected the meat consumption, such as the changes in menu between the baseline and the intervention period in the two canteen and the fact that the last day of the intervention period in the Canteen B

²³ "China consumes more than a quarter of the world's meat. The government wants to change that". World Economic Forum (2016) Retrieved from <https://www.weforum.org/agenda/2016/06/china-consumes-more-than-a-quarter-of-the-worlds-meat-the-government-wants-to-change-that/>

a vegetarian meal was not explicitly written on the menu, as the previous day, but was available only on request.

The green nudge intervention also presented some limitations. Our intervention, in fact, took place in the cafeteria for only four days. It could be that nudges needs a longer period of time to be effective and to give people the possibility to process information. In the experiment of Sonnenberg (2013) with the traffic light food labels, in fact, the intervention period was two months.

Moreover, when people completed the survey we asked if they noticed the intervention and many people did not see it. The poster, in fact, due to an agreement with the canteen, where place at the entrance, where people take their trays and dishes and usually do not spend more than 30 second there. Together with our two posters, there were also two other posters with the name of the canteen and pictures of food that could have distract people from our intervention. Furthermore, it could be the case that our green nudge intervention did not have enough behavioural cues to decrease the meat consumption. Some more nudges, such as default options or changing the choice-architecture could have been applied together with the labels, social norms and the marketing campaign to strengthen the effect of the intervention.

8. Managerial implications

The results show that nudging can be implemented as a food policy to improve consumption habits in terms of sustainability and health, but it has to be done with caution. Nudges, indeed, can sometimes backfire when people feel themselves manipulated in their freedom of choices.

Managers that want to promote ethical and sustainable goods should also be aware of the fact that “being green” requires more time and spaces in people’s lives and that people are open only to environmental ideas that they can implement with as little pain as possible. Therefore, switching from the unethical to the ethical alternatives should be easy for consumers and should not require an extra effort, for example in the search of the products in the supermarket or in the request of the environmental-friendly meal in a canteen/restaurant because is not explicitly written on the menu. Also the nudges therefore, should be immediate, visible and help consumers to take their decisions easily.

It is also important to be clear and transparent with the sustainable certifications because our survey demonstrated that many people find them confusing (38% of our sample) or redundant (26% of our sample). People, in fact, are very demanding in term of sustainability from the corporate sector and if they do not perceive the company/restaurant/university who is selling the products as sustainable they will not trust the sustainable certifications and they will see them as an excuses to charge higher prices.

This study also suggests that understanding consumer typologies is very important to understand food consumption habits and how to lead different people towards a healthier and more sustainable consumption. More personalized communication techniques, based on consumer' segmentation on the base of interests and characteristics, are more persuasive and can link the recommended behaviour/products to the exact individual's needs and wants. For hedonistic consumers, for example, it would be effective to underline the special taste that organic and sustainable products have in comparison with the unethical alternatives. For modern reflexive, instead, is important to focus the promotion on the positive contribution that the products have to the world and for holistic consumers is also very important to emphasize the health aspect.

9. Conclusion

This paper analyses the effect of a multicomponent green nudge intervention on the meat consumption in a university canteen. A natural field experiment was conducted and we obtained 680 observations. We followed the Difference in Difference study design (Gertler et al., 2016), where two identical situations in two university canteens were compared but where one variable was changed in one situation, the green nudge intervention.

The results show that the intervention affected the meat consumption significantly, but not in the desired directions. The meat consumption, in fact, increased during the intervention period in comparison with the baseline period. That means that the probability of eating meat was 16% higher when the nudges when applied. However, many limitations biased our results and we believe that without the previously mentioned confounding effects the results would have been different. The intervention did not affect the consumer typologies differently; all the moderators were indeed insignificant. However, in general, meat consumption habits were significantly different for Hedonistic, Modern Reflexive and Holistic consumer. The last two categories consumed, in fact, less meat than the people classified as hedonistic.

Looking at the demographic data, we can conclude that the probability of eating meat is definitely lower for women than for men and that it decreases with aging. Asiatic people were the only one that differed from people from Benelux in the meat consumption, with a 23% higher probability of eating meat.

10. Further Research

For further researches it is suggested to develop an experiment implementing the complete green nudge intervention of Schubert (2016), including not only labels and social norms but also default options and monetary incentives. For default option it is suggested to offer a vegetarian or vegan option as meal of the day and for monetary incentives an idea could be to create a "Veggie-Card" to distribute in the canteen and to stamp at the cash register when people eat vegetarian, after 10 stamps they will then receive a vegetarian meal for free.

Another suggestion is also to have a longer intervention period to give people the time of processing information and to better control for confounding effect, such as menu changes that can affect a one-week intervention.

It would be interesting also to replicate the experiment in hospitals' canteens or companies' canteens to see if these people react to the nudges differently from students.

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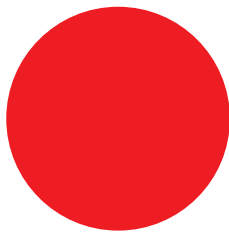
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12. Appendix

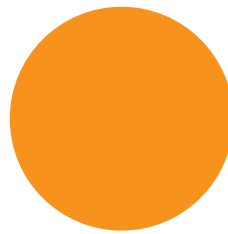
Appendix A: Explanation of Eco-labels

CHECK HOW CLIMATE FRIENDLY
IS YOUR MEAL!

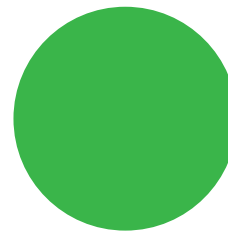
level of CO₂ emissions



HIGH



MEDIUM



LOW

BE CONSCIOUS,
CHOOSE GREEN!



Calculated through Eaternity.org

Appendix B: Social Norm Poster



Appendix C: Survey to gather data for Social norms

1. Are you vegetarian?
 - Yes
 - No
2. Are you vegan?
 - Yes
 - No
3. Did you eat vegetarian today at the canteen?
 - Yes
 - No

Results obtained



ONE DAY MAKES A HUGE DIFFERENCE:

By **replacing your daily meat** today with a plant-based option, you would contribute to a sustainable world as much as by:



Avoiding showering for the next 2.5 months



Leaving your phone uncharged for the next 4.5 years



Switching off your light for 200h



Leaving your electric car at home for the next 68 km

TODAY IS YOUR DAY TO MAKE
THAT DIFFERENCE:
 EAT GREEN!

References:
Meatlessmonday.com
Cowspiracy.com

Appendix E: Survey

Which type of “conscious” consumer are you?

Please rate on a scale from 1 to 7 ranging from “completely disagree” to “completely agree” to what extent these factors drive you to the decision.

1. PURCHASE OF ORGANIC VEGETABLES

(Lusk & Briggeman, 2009; Lockie et al., 2000, 2002; Schösler et al., 2013)

A: If I buy organic vegetables, I do it because of the taste

B: If I buy organic vegetables, I do it because of the environment

C: If I buy organic vegetables, I do it because of my health

2. VEGETERIAN & VEGAN DIET

(Johnston and Baumann, 2007; Honkanen, 2006; Schösler et al., 2013).

A: I sometimes adhere to a vegetarian/vegan diet, or I would like to because vegetables taste better than animal products

B: I sometimes adhere to a vegetarian/vegan diet, or I would like to because meat production is bad for the environment

C: I sometimes adhere to a vegetarian/vegan diet, or I would like to because I believe that animals are our fellow creatures

3. GROCERY SHOPPING

(Rappoport, 2003; Honkanen, 2006; Schösler et al., 2013)

A: When I do my groceries, I will be influenced by good appetite

B: When I do my groceries, I will be influenced by logic reasoning

C: When I do my groceries, I will be influenced by my feeling of intuition

4. FOOD CHARACTERISTICS

(Johnston and Baumann, 2007; Lockie et al., 2002; Padel & Foster, 2005; Schösler et al., 2013)

A: My food must be easily digestible with natural flavours

B: My food must be produced in a responsible way

C: My food must be contributing to my mental and physical health

5. EXOTIC FOOD

(Fischler, 1988; Donald & Blay-Palmer, 2006)

A: I like foreign, 'exotic' food because I want to explore new flavours

B: I like foreign, 'exotic' food because I can support the small farmers in developing countries

C: I like foreign, 'exotic' food because I like to experience the culinary richness our world has to offer

6. SUSTAINABLE CERTIFICATION

(Katloft, 2001; Lockie et al., 2002; Clarke et al., 2008)

A: I think 'sustainable' certification marks are redundant

B: I think 'sustainable' certification marks are confusing

C: I think 'sustainable' certification marks are important

7. LOCAL AND SEASONAL PRODUCTS

(Rappoport, 2003; Honkanen, 2006; Schösler et al., 2013)

A: I like to eat locally sourced and seasonally bounded products because they taste better

B: I like to eat locally sourced and seasonally bounded products because it is better for the environment

C: I like to eat locally sourced and seasonally bounded products because it fits my inner state

Demographic data

8. What is your age?

- 16-20
- 21-24
- 25-30
- 31-40
- 41-50
- 51 or older

9. What is your gender?

- Male
- Female

10. What is your nationality?

.....

11. What is your employment status?

- University's Staff
- Student
- External

12. Are you vegetarian?

- Yes
- No

13. Are you vegan?

- Yes
- No

14. Did you eat meat today at the canteen?

- Yes
- No

15. If you would like to know which type of conscious consumer you are, please insert your email.

Profile A: hedonistic consumer

For the hedonistic consumer it is typical that the taste is a critical factor in deciding on a meal and the ingredients that it contains. You probably love good quality food that is easy to digest and contains fewer supplements, making the taste of the product really stand out. You like to explore 'exotic' food because you like to taste as many flavours as possible. That is why you are sometimes tempted to buy products that have come from afar. When you buy sustainable products, like organic or locally farmed vegetables, you do it because of the taste; favourable effects on the environment are only a circumstance.

Profile B: modern reflexive consumer

For the modern reflexive consumer it is typical to be guided by logic reasoning. You probably think a lot about the effects that your consumer behaviour has on the environment, animal wellbeing and producers. You think it is important to make a positive contribution to the world and that is why you shop in a conscious and justified way. You like to choose Fair Trade, organic or locally farmed vegetables from small producers. You like to choose modern, healthy and variable meals without much meat. Sometimes it is hard for you to decide what the best products

are, because there are so many different certification marks and you are having a hard time trusting them all.

Profile C: holistic consumer

For the holistic consumer it is typical to make decisions based on feelings and intuition. You feel a strong connection with nature and therefore you like to eat seasonally bounded and mostly vegetarian or vegan options. You could also be interested in New Age philosophies, Eastern religions or spiritual world visions, which is why you are also familiar with 'exotic' food. Health is very important to you, after all, being good to yourself also means being good to the world around you. You believe food contributes to your mental and physical health and you will adjust your diet to it. Sometimes you choose imported products, like avocado, because these are healthy.

Appendix F: Pictures of the intervention





Appendix G: The code

*GENERATE VARIABLES

```
gen eat_meat=0
replace eat_meat=1 if Didyoueatmeattoday=="YES"

gen period=0
replace period=1 if Period=="Intervention"

gen canteen=0
replace canteen=1 if Canteen=="RSM"

gen DiD=period*canteen

gen hedonistic =0
replace hedonistic=1 if consumertypology=="Hedonistic"

gen mr_holistic=0
replace mr_holistic=1 if consumertypology=="Modern Reflexive -
Holistic"

gen mr=0
replace mr=1 if consumertypology=="Modern Reflexive"

gen holistic=0
replace holistic=1 if consumertypology=="Holistic"

gen hedonistic_holistic=0
replace hedonistic_holistic=1 if consumertypology=="Hedonistic -
Holistic"

gen hedonistic_mr=0
replace hedonistic_mr=1 if consumertypology=="Hedonistic - Modern
Reflexive"

gen gender=0
replace gender=1 if Whatisyourgender=="Male"

local categories "mr_holistic mr holistic hedonistic hedonistic_holistic
hedonistic_mr"
foreach cat in `categories' {
    gen DiD`cat'=DiD*`cat'
}

gen Benelux = 0
```

```

replace Benelux=1 if Whatisyournationality== "Dutch" |
Whatisyournationality=="Belgian" |
Whatisyournationality=="Luxembourgish"

gen Asian = 0
replace Asian=1 if Whatisyournationality== "Chinese" |
Whatisyournationality=="Indian"| Whatisyournationality== "Indonesian" |
Whatisyournationality=="Iranian" | Whatisyournationality== "Malaysian" |
Whatisyournationality=="Nepalese"| Whatisyournationality==
"Philippinen" | Whatisyournationality=="South Korea" |
Whatisyournationality== "Taiwanese" |
Whatisyournationality=="Vietnamese" | Whatisyournationality== "Hong
kong"

gen American = 0
replace American = 1 if Whatisyournationality== "American" |
Whatisyournationality=="Canadian" | Whatisyournationality== "Brazilian"
| Whatisyournationality=="Chile" | Whatisyournationality=="Argentine" |
Whatisyournationality=="Colombian" | Whatisyournationality=="Mexican" |
Whatisyournationality=="Uruguay" | Whatisyournationality=="Venezuelan"
|Whatisyournationality=="Surinaamse"

gen East_European = 0
replace East_European=1 if Whatisyournationality== "Albanian" |
Whatisyournationality=="Azerbaijan" |
Whatisyournationality=="Bulgarian" | Whatisyournationality=="Estonia" |
Whatisyournationality=="Georgian" | Whatisyournationality=="Latvian" |
Whatisyournationality=="Moldovan" | Whatisyournationality=="Romanian"
| Whatisyournationality=="Russian" |
Whatisyournationality=="Ukrainische" | Whatisyournationality=="Kosova"

gen North_European=0
replace North_European=1 if Whatisyournationality== "Brithis" |
Whatisyournationality=="Finnish" | Whatisyournationality=="Norwegian" |
Whatisyournationality=="Swedish" | Whatisyournationality=="Irish"

gen Central_European = 0
replace Central_European=1 if Whatisyournationality=="Czech" |
Whatisyournationality=="Hungarian" | Whatisyournationality=="Austrian"
| Whatisyournationality=="German" | Whatisyournationality=="Polish" |
Whatisyournationality=="Slovak" | Whatisyournationality=="Slovenian" |
Whatisyournationality=="Swiss" | Whatisyournationality=="slovak"

gen Mediterranean = 0
replace Mediterranean=1 if Whatisyournationality== "French" |
Whatisyournationality== "Greek" | Whatisyournationality=="Italian" |

```

```
Whatisyournationality=="Spanish"| Whatisyournationality=="Turkish" |  
Whatisyournationality=="Maltese" | Whatisyournationality=="Cypriot" |  
Whatisyournationality=="Portuguese"
```

```
gen African = 0  
replace African=1 if Whatisyournationality== "Egyptian" |  
Whatisyournationality=="Ethiopian" | Whatisyournationality== "Ghanaian"  
| Whatisyournationality=="Kenyan" | Whatisyournationality=="South  
African"
```

```
gen Other = 0  
replace Other=1 if Whatisyournationality== "Aruba" |  
Whatisyournationality=="Australian" | Whatisyournationality=="Dutch /  
American" | Whatisyournationality=="Dutch/ Colombian" |  
Whatisyournationality=="Dutch/italian" |  
Whatisyournationality=="Dutch/english" |  
Whatisyournationality=="German / Brazilian" |  
Whatisyournationality=="French Japanese" |  
Whatisyournationality=="Spanish-german" |  
Whatisyournationality=="Suriname/Indian/dutch"
```

```
gen young16_20 = 0  
replace young16_20 = 1 if Whatisyourage == "16-20"
```

```
gen young21_24 = 0  
replace young21_24 = 1 if Whatisyourage == "21-24"
```

```
gen age25_30 = 0  
replace age25_30 = 1 if Whatisyourage == "25-30"
```

```
gen age31_40 = 0  
replace age31_40 = 1 if Whatisyourage == "31-40"
```

```
gen age41_50 = 0  
replace age41_50 = 1 if Whatisyourage == "41-50"
```

```
gen age51_older = 0  
replace age51_older = 1 if Whatisyourage == "51 or older"
```

* BINARY LOGISTIC REGRESSION

```
logistic eat_meat DiD period canteen,r
```

```
logit eat_meat DiD period canteen,r  
margins, dydx(*)
```

```
logit eat_meat DiD period canteen gender Other Asian American  
Mediterranean East_European North_European Central_European African,r  
margins, dydx(*)
```

```
logit eat_meat DiD period canteen gender Other Asian American  
Mediterranean East_European North_European Central_European African  
young21_24 age25_30 age31_40 age41_50 age51_older, r  
margins, dydx(*)
```

```
logit eat_meat DiD period canteen mr_holistic mr holistic  
hedonistic_holistic hedonistic_mr gender Other Asian American  
Mediterranean East_European North_European Central_European African  
young21_24 age25_30 age31_40 age41_50 age51_older ,r  
margins, dydx(*)
```

```
logit eat_meat DiD period canteen mr_holistic mr holistic  
hedonistic_holistic hedonistic_mr DiDmr_holistic DiDmr DiDholistic  
DiDhedonistic_holistic DiDhedonistic_mr gender Other Asian American  
Mediterranean East_European North_European Central_European African  
young21_24 age25_30 age31_40 age41_50 age51_older,r  
margins, dydx(*)
```

```
logit eat_meat DiD period canteen mr_holistic mr holistic  
hedonistic_holistic hedonistic_mr DiDmr_holistic DiDmr DiDholistic  
DiDhedonistic_holistic gender Other Asian American Mediterranean  
East_European North_European Central_European African young21_24  
age25_30 age31_40 age41_50 age51_older,r  
margins, dydx(*)
```

```
logit eat_meat DiD period canteen mr_holistic mr hedonistic  
hedonistic_holistic hedonistic_mr DiDmr_holistic DiDmr DiDhedonistic  
DiDhedonistic_holistic gender Other Asian American Mediterranean  
East_European North_European Central_European African young21_24  
age25_30 age31_40 age41_50 age51_older,r  
margins, dydx(*)
```

```
logit eat_meat DiD period canteen mr_holistic DiDmr DiDholistic gender  
Other Asian American Mediterranean East_European North_European  
Central_European African young21_24 age25_30 age31_40 age41_50  
age51_older,r  
margins, dydx(*)
```

```
fitstat
```

Acknowledgements

My heartfelt thanks to my supervisor Brian Chung for his precious support and suggestions. My gratitude goes also to Pinar Coskun and all the members of the Erasmus Food Lab that accompanied me in my thesis process with enthusiasm and motivation. Infinite thanks also to my friends and study colleagues Lorenz Widmann, Maria Karra, Sibren Iwema and Viktor Zöld for helping me interviewing people at the canteen during the thesis experiment.