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The preference of fast-food consumers for or against vegan options in fast-food restaurants

Author: Ramdjan, A.

457353AR

Supervisor: Hasselt, MJL van

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Executive summary
This research examines the relevant purchasing criteria for Dutch consumers when ordering vegan, vegetarian or meat items in fast-food restaurants. The research started by using significant criteria that were found to be significant in earlier research (Allès et al., 2017; Ellithorpe et al., 2022; Farhana & Islam, 2011; Freeland-Graves et al., 1986; Garza et al., 2016; Hoek et al., 2004; Kumar & Kapoor, 2015; Lehto et al., 2021; Park, 2004; van der Horst et al., 2011; Whitton et al., 2013). The research then employed a discrete choice survey in order to find out whether or not these criteria hold true for the Dutch consumer. The conclusion of this research is that the criteria *Waiting_time, Carbon_footprint, Price* and *Cleanliness* are significant for regular fast-food consumers, while C*arbon_footprint, Ingredients, Cleanliness, Price* and *Company* are significant for vegan and vegetarian fast-food consumers. The research found that fast-food restaurants with ambitions to attract vegan and vegetarian consumers should focus on price, hygiene, branding (all of which are commonly known) and their products' ingredients and carbon footprint. This research could be extended to other sources of vegan and vegetarian food or to have the survey held among a larger and more diverse group of respondents, in particular Dutch residents with immigrant origins.

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Meat Wars: The Rise of Veganism

While the overall meat consumption still rises (Wageningen University & Research, 2020), for a couple of decades, veganism and vegetarianism have been rising in popularity (Allen, 2021). Over the years new terms have come out to label the lifestyle changes that people make, such as flexitarians (who plan meat-free days in their week), pescatarians (who eat fish but not meat), pollotarians (who eat poultry but no red meat) or part-time vegans (who plan vegan days in their week). It all comes down to the same thing: the consumer wants options that do not feature meat. A news source (Olayanju, 2019) confirms this in interviews with multiple experts in the industry.

Flora and fitness

There's good reason to make the switch from an omnivore diet to a vegan diet (for the purposes of this introduction we assume that vegan is an umbrella term that is to include the other types, such as vegetarian and part-time vegan). First, from a personal perspective, a vegan diet can be healthy. According to BBC Radio (2017), "Advocates of plant-based eating say vegans typically have lower levels of cholesterol and blood pressure, a lower body mass index, and reduced risk of death from heart disease and cancer." This is further backed by multiple other sources. Research from Kim et al. (2019) and Tong (2019) both reference lower risk of heart disease found among participants that ate reduced amounts of meat. Mayo Clinic (2019) mentions that in research among nearly 70.000 volunteers they found that people who didn't eat meat at all had lower cancer rates than their omnivore peers and also among other types of diets. ScienceDaily (2022) mentions that consuming a plant-based diet, even if not completely vegan, can lead to lower blood pressure. Lastly, Tonstad et al. (2009) reported that in their study among a population of nearly 60,000 people across North America, the mean body mass index, or BMI, was lowest in vegans and increasingly higher based on how much meat and/or dairy and/or fish was consumed.

Grounds for plants

Health however is far from the only reason to go for a more plant-based diet. A popular reason to not eat meat is the animal mistreatment that occurs in the food industry on a large scale (where the treatment of animals leans heavier on the stock portion of livestock than on the live portion) (Schwartz, 2018). On a larger scale, more plant-based diets, or rather less meat consumers can lead to a reduction of world hunger (Stipek, 2017). Another reason is that due to the emissions related to the production of meat, the greenhouse effect is accelerated, causing an increase in global warming (Djekic, 2015), which again means that more plant-based diets are a part of the solution to a large-scale problem. Lastly, in the past couple of years Covid has shown that meat production can be seriously halted, as was the case for US fast-food chain Wendy's when it experienced a shortage of fresh beef in May of 2020 (Larson, 2020).

So whether the consumer is looking for a healthy alternative, a reduction of their carbon footprint, a more ethical lifestyle, or to help reduce world hunger or the effects of a global pandemic on the availability of food, reducing meat consumption could lead to great personal and societal improvements.

And no company or individual in the world is as big in purchasing (and consequently selling) meat as fast-food chain McDonald's (Nowak, 2015). In 2015 it was touted as the world's biggest purchaser of beef and pork and the second biggest purchaser of chicken, just behind KFC, famous for its chicken. It can be concluded then, that a world with a more plant-based diet should see changes in this part of the fast-food industry, too. And to their credit, they have been doing so for a while now, especially here in the Netherlands.

McVegan

McDonalds introduced its vegan burger, or Groenteburger as it's called in Dutch, in 1993 (Feder, 1992), and while it was not the first vegan or vegetarian burger it had produced since being founded, it was the first successful one and one that would remain on the menu for nearly 25 years. When it was removed, however, another non-meat option took its place, which was a chicken meat-replacement option produced by the company Valess, and aptly named the Valess burger (Valess, n.d.). Important to note here is the switch from an all-vegetable burger to a meat replacement burger. McDonalds went from a product that mainly appeals to vegans and vegetarians, to a product that has the potential to lure in new customers, former meatlovers turning flexitarians or the like. This sparked a bit of a reaction from the vegan community (*McDonald's haalt groenteburger van het menu*, 2018) but since then the burgers seem to be doing well, with new burger variants being released along with the veggie chicken nuggets and for a limited time, the McPlant. It should also be noted that the McPlant, despite its name, is modelled after the other beef burgers and also does not carry a vegan or vegetarian quality mark (McDonalds, 2019, 2021).

McDonald's is far from the only one though. In 2019 Burger King released the Impossible Whopper, a burger that was made with plants as the ingredients of its patty (Capritto, 2019). Subway has had the veggie patty for years and in 2011 it released the vegan patty to Canada (Vegetarian Resource Group, 2012), before releasing it to the rest of the world in 2019 (Gross, 2019) as a replacement of their vegetarian version. Recently even KFC launched its own vegan option, the Beyond Fried Chicken in 2022 which, although ingredient-wise it could be qualified as vegan, the process it undergoes from ingredients to finished product disqualifies it (since it shares a fryer with animal products) (VeggL, 2022).

It is worth noting though, that, while McDonalds made a switch in favour of new customers at the expense of vegans and vegetarians, from the all-vegetable burger to a meat replacement burger, Subway has decided to walk the opposite direction with the introduction of their vegan patty. McDonalds is market leader of the fast-food industry and has been selling their vegan option for almost 25 years before replacing it with their meat-replacement option. It can be deduced then, that McDonalds found that their product wasn't performing well enough to warrant it over the meat-replacement burger. From this it can be concluded that McDonalds' market research told them that the best choice would be to target potential meat eaters, to try and convince them to make the switch to non-meat. Given that market leader McDonalds chose this direction, why then did Subway choose to walk the opposite path? Why would Subway remove their vegetarian option and introduce the vegan version?

Eat Fresh

Subway started its business in 1965 as "Pete's Super Submarines" (Business Insider, 2019) and the premise of the company was to prepare sandwiches right in front of the customers with any fresh and healthy ingredients that the customer would want. Subway quickly shifted to a franchising model in 1974 (Subway, n.d.-b) which has allowed them to become the world's largest submarine sandwich chain, boasting more than 40.000 locations worldwide. It did so by having a low entry cost for franchisees – between 116.000 dollars and 263.000 dollars (Business Insider, 2019) as compared to McDonalds' 2.2 million dollars – and having very little requirements for opening a franchise. It also had no protected territory, however, which meant that other franchisers could possibly cannibalise each other's sales by opening stores too close to one another. Subway corporate still benefited, because more locations meant more franchising fees and a similar level of royalties, so there was no incentive to stop what was going on.

5-dollar footlongs

But that changed in 2015. The image of the company, Jared Fogle was charged for several charges related to paedophilia. Increased competition from other brands, that often have more fresh products, the cannibalisation occurring between franchises and the scandal all had their effect on Subway's bottom line. The conclusion on Subway's end was to reduce the amount of franchises and redesign their menu, as well as some aesthetic changes and facilities such as Wi-Fi, USB-ports and power sockets (Business Insider, 2019).

That was 2019. Three years later, however, popular show host John Oliver dedicated a piece of journalism to Subway, in which he concluded that many of the issues hadn't actually been solved (Oliver, 2022) and that things might have even gotten worse. The so-called "Business Development Agents", often franchise owners themselves, who are tasked with controlling certain areas and helping in opening new franchise locations and receive a cut of the royalties paid to Subway corporate, were allegedly exceptionally harsh in their inspections of franchise locations. Getting those violations as a franchisee could lead to the agreement being terminated, after which the locations would be sold off , with the Business Development Agents sometimes buying those locations themselves at a discounted price. This is an obvious incentive for those agents to be exceptionally harsh in their review of those locations that they supervise. While Subway's rebuttal was that Oliver's segment was based on old facts, The New York Post reported just this year about a franchise in Brooklyn that a Subway inspector claimed the shop didn't bake fresh bread or mopped the floor the night prior (Kosman, 2022). Exactly like Oliver, and Business Insider before him, reported in their respective pieces of journalism.

It can be concluded then, that Subway's decision making leaves a lot to be desired. While fighting legal issues, corporate restructuring, contract redrafting and franchisee-relationship managing are not our area of expertise, perhaps we can assist Subway when it comes to the marketing department. Specifically, who are their current core customers? What is their current positioning within the market? If they were to introduce a new product, which consumers are most likely to be attracted? Which product – meat-replacement or plant-based – is expected to perform better?

The veggie best, like no one ever was

The research into vegetarian options in fast-food restaurants is extensive, as noted in the previous paragraphs. However, the research is mainly focused on the US and other foreign countries. The US is a massive market to capitalise on and if it works, that is, to convert many a meatlover into a flexitarian or the like, then that would be great for the environment and for the meat-replacement industry. It is true that the US is the second largest meat-replacement industry in the world (Statista, 2021) in terms of total revenue measured in dollars (See also figure 1 in the appendix). However, the US is also one of the bigger countries in terms of population (worldometer.info, n.d.), which means it will naturally

shift towards the top of the list when it comes to GBP and subsequently, expendable income and revenue. When that revenue gets corrected for the population per country, it turns out Switzerland becomes number one instead of China, and the Netherlands becomes number two, separated from the rest of the list by a fair margin (See also table 1 in the appendix). According to the Big Mac Index, commonly used to compare prices and purchasing power in different countries, Switzerland is one of the most expensive countries in the world (The Economist, 2022) which explains the relatively high index per capita. That leaves the Netherlands. And a news source (RTL, 2021) indeed confirms that, at least in Europe, the Netherlands is the country whose population eats the most meat substitutes per capita, according to Nielsen, a research agency that did research on behalf of non-profit organisation ProVeg. This means that the Dutch market is more interesting to study in the short term, because of the fact that the Dutch market already consumes a lot of meat substitutes per capita. If the Dutch consumer already consumes a lot of meat substitutes, then it means that consumers are already aware of and used to the product's existence and consume it in their daily life more often. It means that the consumers are more likely to be affected by choices made in marketing of these products, simply because they are more likely to be interested in them.

The list of countries that consume meat substitutes, as mentioned above also leaves an interesting country completely out. India, the country with the highest percentage of vegetarians in the world (Sara's veggie kitchen, 2022 and Biswas, 2018) is not represented at all. The big mac index places Indonesia a lot lower than India, has less than a fifth of its population, doesn't even show up on lists regarding the number of vegetarians per country and still scores relatively high in the worldwide meat substitute revenue list. The same goes for Iran and similarly South Korea (which scores higher on the BMI but significantly lower on population per country and doesn't even show up on the vegetarians per country). Something else must be going on, surely? Could it be that India's vegetarianism is more plant-based, rather than meat-substitutes? And what does that mean for the Netherlands?

Because vegetarianism and veganism are here to stay, as discussed earlier, and because the Dutch market is mainly aimed at meat-replacements instead of plant-based options, we feel like it's time to discuss exactly which processes the decision-making process of a fast-food consumer consists of when choosing between a meat-replacement and a plant-based option, and how much they affect that decision.

The meat of the matter

This research aims to give insight based on economic theory and a limited field study, into the decision-making process of consumers in fast-food restaurants when choosing between different non-meat options. Decision making processes are part of consumer behaviour, which is why this research delves

into the existing literature regarding that topic in order to find out what all is known about this topic, before starting the field study.

For practical purposes this research will be limited by a couple of factors. First, this research will focus exclusively on consumers in the Netherlands and more specifically in the Randstad area. This is in line with the insights from earlier that indicated that the Netherlands would be an interesting research subject, as well as it being one of the natural limitations of this research. There is still a distinction to be made between foreign visitors, locals (such as minorities that have since naturalised and adopted the Dutch nationality or are in the process of doing so) and the traditional Dutch that spend money in Dutch fast-food restaurants, however given that sales data of the companies involved do not distinguish between any of these categories, this research will assume that the data(sets) acquired from these companies will be about the Dutch fast-food consumer, and that any error terms that come up may be the result of the inconsistencies of the origin of consumers.

Second, while there is a wide variety of fast-food chains that are implementing their non-meat option to compete with the rest of the industry, this research focuses on two specific chains.

- McDonalds, who was the first multi-national chain to implement meat-replacement (and replaced its vegan option) and who is also market leader in the industry.
- Subway, who is the first multi-national chain to switch to a fully vegan non-meat option, after having a non-vegan option for a couple decades prior.

We also only compare two options, one for each chain. For McDonalds, we select the McPlant, and for Subway, we select the Vegan Patty.

The question of this research is as follows:

What buying criteria does the Dutch fast-food consumer consider when choosing between the McPlant from McDonalds and the Vegan Patty from Subway, given the trend sensitivity of non-meat options, and how does that differ from the buying criteria of the vegan Dutch fast-food consumer?

In order to answer this question, the following sub-questions will be asked and answered.

1. What are the buying criteria that fast-food consumers depend on when making decisions?
2. What are the buying criteria that vegan fast-food consumers depend on when making decisions?
3. Does the Dutch fast-food consumer consider them as well and if so, how important are they in determining the outcome?

4. Does the vegan Dutch fast-food consumer consider them as well and if so, how important are they in determining the outcome?

The first two questions can be answered by reviewing existing literature. In order to answer questions 3 and 4, a survey was held among 205 Dutch participants.

Before the questions can be answered however, a couple of definitions need to be addressed. For the purposes of this research, the term veg*an is used whenever the research refers to a group of individuals that can belong any of the following groups: vegan and vegetarian. This term has been borrowed from Le (2019) who used it to group up the vegan, vegetarian and flexitarian subgroups. For the purposes of this research the term has been reduced back to the vegan and vegetarian subgroup.

Fast-food consumer refers to the Dutch fast-food consumer that participated as respondents as analysed by the survey.

Theoretic Framework

Ferrell et al. (2021) describes the Consumer Purchase Decision journey as follows: the consumer has a need that it is not fully aware of. The consumer then translates their needs into wants for a specific set of products or brands, based on brand perceptions and exposure to recent touch points. Then the consumer adds or subtracts brands as they evaluate what they want, based on other user's experiences as well as external sources (though Ferrell et al. considers that personal sources are seen as more trustworthy), which ultimately leads to the consumer selecting a brand at the moment of purchase. After purchasing the product or service, the consumer builds expectations based on experience to help make the next decision journey shorter and easier.

In order to market the product to the consumer, the company therefore has to advertise to the consumer that the need that they have can be solved by their product. The company must also do this in the relative recent past when a consumer translates their need into a want, which requires the company to be in the forefront of their potential consumers' minds.

But companies have more to worry about than just marketing their product and brand to their potential consumers. In order to introduce a new product, companies must often do research. This research can be expensive and time-consuming and the outcome is uncertain, which means it involves a certain level of risk. In order to try and reduce as much risk as possible, companies often use a form of evaluation prior to making the decision, in which they assess among a selection of options, which solution will result in the highest net result. Kahmaran et al. (2007) describes two steps in a systematic decision-making process for selecting more rational new product solutions. During the first step, the company is mainly concerned with coming up with as many potential candidate solutions as possible.

During the second step, the company is selecting from those solutions. In a sense, the company is undergoing the same process as their consumers: both are trying to serve a need, do research to identify possible solutions and eliminate options until there is one left.

The processes are connected too. If consumers aren't willing to pay for the product, then the company's sales will not live up to expectations. It is therefore of the utmost importance that companies are capable to accurately predict how consumers are thinking, what purchasing criteria they are considering and most importantly, which purchasing criteria are relatively unimportant. After all, investing in a product that is very carbon footprint-neutral, when consumers don't care as much about it as they would about the price or colour of the product, is an investment that will not result in an increase in sales and profit.

Question 1: What are the buying criteria that fast-food consumers depend on when making decisions?

Current academic literature regarding consumer behaviour is extensive for fast-food and for veganism. While some researchers have found that impulsivity and imagery have proven to be influential external factors in the decision-making process of fast-food consumers (Garza et al., 2016; Ellithorpe et al., 2022 respectively), Farhana & Islam (2011) have tried to formulate why (Bengali) consumers of fast-food make decisions in the way that they do, despite the consumers having access to information about the consequences of those decisions. They found that consumers tend to be loyal to their preferred fast-food restaurants and that they perceive the quality of a product only if doing so is supported by their income level.

Park (2004) found that Korean consumers of fast-food restaurants tend to be more appreciative of the hedonic attributes, such as taste, cleanliness, kindness and facilities, over the more objective, utilitarian attributes, such as price, promotional incentives and quick service. Hedonism is explained in Economics to aim for the maximisation of pleasure of the individual, and in this context, it stands for the variables that speak to someone's emotional side. Utilitarianism aims for the maximisation of utility for the largest group of people, and in this context is more about factual variables and speaks more to someone's rational side.

Van der Horst et al. (2011) stated in their research that fast-food consumption among Swiss households are likely to be correlated with gender, age, the time spent cooking and cooking skills, while for take-away food it’s likely to be gender, age, income, education and mental effort, indicating that for fast-food, as compared to other food, the focus is less on income and education and more about saving on the time spent learning to cook and cooking the meals. This makes sense, given that

the name, fast-food, indicates to the consumer that they will be able to save time, as compared to regular food.

Whitton et al. (2013) found during their study that among Singapore residents, fast-food consumers were more likely to have a waist-to-hip ratio indicating abdominal obesity along with increased daily energy intake, daily recommended fat (and saturated fat) intake and decreased consumption of fruit and wholegrain, indicating that fast-food consumers were more likely to be considered overweight. It was also found that fast-food consumption was most prevalent in young adults and middle education level, which mirrors the ideas put forward so far by the other groups relatively well.

Question 2: What are the buying criteria that vegan fast-food consumers depend on when making decisions?

Kumar and Kapoor (2015) found that the buying behaviour of Indian consumers is different between vegetarian and non-vegetarian food products. They found that age and income are significant factors in the decision-making process of purchasing vegetarian products, but not of non-vegetarian products, possibly indicating that the two categories are appealing to different groups of individuals. While this does sound contradictory with the research from van der Horst et al., indicating that there are regional differences, it could be due to the fact that van der Horst et al. did not differentiate between vegetarian and non-vegetarian foods, or due to the fact that Kapoor and Kumar's research was not about fast-food specifically.

Freeland-Graves et al. (1986) suggested that vegetarians as a group of individuals tend to be slightly less well educated and employed in less-skilled occupations (which matches findings of the previous research) but also find that they socialise more than their non-vegetarian equals, often in part due to their strong commitment to vegetarianism and their friend and family network mostly consisting of other vegetarians. This indicates that vegetarians seem to enjoy one another's company more than their non-vegetarian peers. This means that for any fast-food company that's looking to successfully lure in vegetarians, it might be worthwhile to invest in comfortable lounges or similar seating options to accommodate the vegetarian friend groups. This would also be in line with Park's findings about facilities for fast-food consumers.

Hoek et al. (2004) found that Dutch vegetarians tend to put more emphasis on health, ecological products, product information, speciality shops and novelty than their non-vegetarian peers than on the price of a product. Essentially, their decision-making process includes more awareness to the origin and health of products, both for themselves, the people who gathered the produce and the planet. This is in line with vegetarian beliefs that causes them to be actively seeking out products that don't

harm themselves and the people and animals they care about, which requires them to be more conscious in their decision-making process.

Lehto et al. (2021) found in a study among Finnish consumers those with higher relative household income were less likely to be vegetarians than those with relatively lower household income in 2007, however this effect was not found in 2017. Their study ultimately concluded that there was no significant effect of income level on the presence of a vegetarian diet, or vice versa. The effect of education on vegetarianism however did occur.

Lehto et al. were not the only ones to find this. Allès et al. (2017) found in their study that vegetarians were more likely to have higher education, however vegans tended to have a lower education level than vegetarians, having similar percentages compared to meat-eaters. Other findings were that vegetarians were more likely to be women and younger individuals than meat-eaters and to be self-employed or never employed. Vegans were more likely to be self-employed or never employed than vegetarians and more likely to be male in comparison to the other two categories, although more women participated in the research as a whole (78%) which meant that all categories were dominated by women. Due to this the research remains inconclusive on the likelihood of vegetarians or vegans being male or female.

With this the theoretical framework for the survey can be constructed, utilising the previous research's most prominent findings. Farhana & Islam found that loyalty to a company is strong in fast-food consumers and that a consumer will only observe the quality of the fast-food product if the income level supports this. This research will therefore test if the Dutch fast-food consumer is loyal to either company. Moreover, this research will also test whether or not the Dutch fast-food consumer also observes the quality of a product only if the income level supports this. Park and Freeland-Graves et al. determined that consumers put more emphasis on the importance of hedonic variables than the importance of utilitarian variables, while Van der horst et al. found that fast-food consumers put emphasis on the time spent on a product. Kumar & Kapoor also found a difference between the consumer behaviour of veg*an and non-veg*an consumers. We will test whether the hedonic variables are more important than utilitarian variables for veg*an and non-veg*an consumers, and whether the time spent is more important than the hedonic variables for veg*an and non-veg*an consumers. This research will also test whether caloric value and carbon footprint are of importance, given Hoek et al.'s found that veg*an consumers spend more time to research the products they are interested in purchasing. Freeland-Graves et al. found that veg*an consumers put emphasis on the social aspects of eating (such as eating in, dining in groups).

To test Farhana & Islam's theory on the consumer's loyalty to a company, the following hypotheses were formulated:

H1: Company loyalty is a significant purchasing criterion for the Dutch fast-food consumer.

H2: Company loyalty is a significant purchasing criterion for the Dutch veg*an fast-food consumer.

To solve the apparent conflict of theories between Park's and Freeland-Graves et al.'s theory that hedonic variables are more likely to influence the fast-food consumer than utilitarian variables and Van der Horst et al.'s theory that fast-food consumers consider the time spent on the product, as well as Kumar & Kapoor's theory that vegetarian consumers behave differently than non-vegetarian consumers, the following hypotheses were formulated:

H3: On average, the utilitarian variables are more significantly influencing the average fast-food consumer in the Netherlands than the hedonic variables

H4: On average, the hedonic variables are more significantly influencing the average veg*an fast-food consumer in the Netherlands than the utilitarian variables

H5: Waiting time is more significantly influencing the average fast-food consumer in the Netherlands than the average of the hedonic variables.

H6: The average of the hedonic variables is more significantly influencing the average veg*an fast-food consumer in the Netherlands than waiting time.

To test whether Hoek's theory that veg*an consumers tend to spend more time to research the products they consumer also holds up for high-calorie fast-food and test whether the average Dutch consumer considers carbon footprint, the following hypothesis was formulated:

H7: Caloric value and carbon footprint are NOT significant purchasing criteria for the Dutch fast-food consumer.

H8: Caloric value and carbon footprint are significant purchasing criteria for the Dutch veg*an fast-food consumer.

To test whether Freeland-Graves et al.'s theory of social eating holds true for fast-food consumers, the following hypotheses were formulated:

H9: Eating together is NOT a significant purchasing criterion for the Dutch fast-food consumer.

H10: Eating together is a significant purchasing criterion for the Dutch veg*an fast-food consumer.

Each of these hypotheses have different variables (that can be measured and/or clearly defined) that are to be assigned to them before the questions can be answered. Company loyalty will be assigned the variable Company, being either McDonalds or Subway. Carbon footprint and caloric value speak for themselves. Time spent is assigned waiting time, which is defined as the amount of time that a consumer must wait for their product to be made. Hygiene will be assigned the variable cleanliness (of the kitchen). Taste is defined in the main ingredient of a fast-food option, being meat, meat-replacement or plant-based. Eating together is assigned the variable amount of people. For the purposes of this research the utilitarian variables are waiting time, caloric value, price and carbon footprint, while the hedonic variables are company, ingredients, cleanliness and amount of people.

All variables will be represented in a formula for the chance that the average Dutch fast-food consumer and average Dutch vegan fast-food consumer respectively, purchases the product.

Let Y be the chance that the average consumer purchases a product;
A be the variable of *Waiting_time* and α be the coefficient with which A increases or decreases Y;
B be the variable of *Price* and β be the coefficient with which B increases or decreases Y;
C be the variable of *Cleanliness* and γ be the coefficient with which C increases or decreases Y;
D be the variable of *Caloric_value* and δ be the coefficient with which D increases or decreases Y;
E be the variable of *Company* and ζ be the coefficient with which E increases or decreases Y;
F be the variable of *Ingredients* and η be the coefficient with which F increases or decreases Y;
G be the variable of *Carbon_footprint* and θ be the coefficient with which G increases or decreases Y;
H be the variable of *Number_of_people* and ι be the coefficient with which H increases or decreases Y;
1 be the Dutch fast-food consumer and 2 be the Dutch veg*an fast-food consumer;
ε be the error term.

This gives the following formula:

$$Y_1 = A_1 \cdot \alpha + B_1 \cdot \beta + C_1 \cdot \gamma + D_1 \cdot \delta + E_1 \cdot \zeta + F_1 \cdot \eta + G_1 \cdot \theta + H_1 \cdot \iota + \varepsilon$$

$$Y_2 = A_2 \cdot \alpha + B_2 \cdot \beta + C_2 \cdot \gamma + D_2 \cdot \delta + E_2 \cdot \zeta + F_2 \cdot \eta + G_2 \cdot \theta + H_2 \cdot \iota + \varepsilon$$

To answer the hypotheses and test this model a questionnaire was designed. After the questionnaire establishes the respondent's basic information, such as age, sex, nationality, income, education, frequency of fast-food consumption and so on, the questionnaire splits the group of individuals up into two categories: veg*ans and non-veg*ans. All individuals are given two fast-food options and are asked to choose between one of those two. Both options have various levels for different variables. All

variables and their various levels can be found in the appendix (table 2). The explanation for determining the levels of each of the different variables can be found below the summary of variables.

Utilitarian variables:

- *Waiting_time* (in minutes)
- *Caloric_value* (in kilocalories)
- *Carbon_footprint* (measured in kg of CO_2; the average Dutch car emits 100 grams of CO_2 per kilometre (Statista, 2022))
- *Price* (in Euro)

Hedonic variables:

- *Company*
- *Ingredients*
- *Cleanliness* (figures 3.1, 3.2 and 3.3 are found in the appendix below)
- *Number_of_people*

Utilitarian variables

The average *Waiting_time* at 5.4 minutes during lunch time peak hours, as reported by Dharmawirya et al. (2012) was used as reference to determine the attribute levels. From this it follows that the attributes should be centred around 5 minutes. With 5 attribute levels this gives 3, 4, 5, 6 and 7 minutes. With *Waiting_time*, the assumed best-case scenario is the one in which the customer has to wait the least amount of time.

The caloric value was taken from the official sources from both McDonalds and Subway's respective offers, as well as the meat option that the McPlant most closely resembles, the Quarter Pounder with Cheese (Dean, 2021). The McPlant had 429 Kcals (McDonalds, n.d.-a), whereas the Quarter pounder with Cheese was found to have 520 Kcals (McDonalds, n.d.-b). Subway's Vegan patty on the other hand has 466 kcals (Subway, n.d.-a). This assumes that the Vegan patty is ordered at 6 inch length, which is a more comparable size to the burgers from McDonalds than the footlong version. It also assumes that the ingredient list consists of cucumber, tomato, iceberg lettuce, red onions and garlic aioli sauce as well as mozzarella-style plant-based slices of cheese. This ingredient list was chosen as a close resemblance to the ingredients of the quarter pounder and McPlant (substituting the cheese for vegan cheese, the pickles for cucumbers, red onions for regular ones and aioli for the sandwich sauces). While the website used for this is UK-based, the Dutch version didn't offer the same calculator unfortunately. For *Caloric_value* the assumed best-case scenario is the one in which the customer consumes the least amount of calories.

Carbon_footprint wasn't as easy to find from an official source, as it's not something either McDonalds or Subway actively portrays on their respective item descriptions on their website. However, a website called Plate Up for the Planet (n.d.) hosts a carbon calculator that allows the carbon footprints of these items to be estimated. This website is run by the Vegan Society along with Planet Friendly Food, both of which are organisations that are campaigning for the transition away from meat consumption. British newspaper Mirror was able to utilise this website along with publicly available information to track down the carbon footprints of the McPlant and the Quarter pounder (Boyd, 2021). The McPlant was found to emit 0,29 kg CO_2, compared to the Quarter Pounder's 4,46 kg CO_2.

For the Subway vegan patty, however, an online source couldn't be found. Instead, a local Subway was visited and a vegan patty was purchased, which was then weighed per individual ingredient as listed in the previous paragraph. While aioli wasn't directly listed, since aioli is an emulsified sauce the research will assume that for the sake of carbon emissions. The ingredients were then added to the website's carbon calculator manually, and it gave an emission of 0,46 kg CO_2. A detailed figure is found in the appendix (figure 2). For *Carbon_footprint*, the assumed best-case scenario is the one in which the customer generates the smallest carbon footprint. To make the carbon emissions less skewed and have a more gradual scaling in the consumer's willingness to buy, this research has added a couple of extra ranks of carbon emissions.

For the price of the Quarter pounder, it was relatively easy to find a price online, however it should be noted that McDonalds operates by franchises and that those franchisees might have different pricing schemes. Nevertheless, the price of the Quarter Pounder should be around the same price for most locations, which was found to be €4,55 (fast-food prijs, 2022).

The McPlant was a little more difficult, due to the fact that it was obviously not on sale at the time of writing this. It took a little more digging and adheres to the same rules about franchises but the price was established at €3,95 (Jaspers, 2021).

For the price of the subway vegan patty a similar problem arises, in that the business is built of franchises. An online search yielded a price of €4,90 (Pricelisto, n.d.).

Because all these prices are close to one another, there is a risk involved of the survey not accurately measuring the price changes and the effect of price on the consumer's willingness to buy. For this sake, two other, similar prices have been included in accordance with the existing prices.

Hedonic variables

The levels for the variable *Company* (McDonalds and Subway) speak for themselves. The ingredients respondents could choose between were meat, meat-replacement and plant-based patty. While the

effects of eating together versus eating alone are well-known (McCafferty, 2019; Myers-Wright, 2018; Ruddock et al., 2019), it seems there is no consensus on how many people one should eat with, before it is considered a group. For this purpose, the decided-upon categories are 1, 2, 3, 4 and more than 4 people, respectively, with 1 person representing the situation in which the respondent eats alone. Neither eating together nor the *Ingredients* are categories in which one option is clearly better; while it might be good to eat together, it might already suffice to eat with 3 people, and 4 or more people could actually end up being a detriment to the enjoyment and/or preference of the consumer.

A photo of the kitchen that the product comes out of will be added to illustrate the cleanliness of the kitchen the product came out of, with kitchen one being a clean kitchen, kitchen two being a messy kitchen and kitchen three being a dirty kitchen. The assumed best-case scenario for *Cleanliness* is the clean kitchen, or kitchen number 1, followed by the messy kitchen and dirty kitchen respectively. The photos as shown to respondents are available in the appendix below (figures 3.1, 3.2 and 3.3).

Before we discuss the outcome of the survey and the answers to the hypotheses however, it is best to set up some ground rules for the survey, such as who the survey should be targeting. After all, it doesn't make much sense to ask a question about fast-food to people who do not frequent fast-food. However, in order to reach as many people as possible, this research does not forbid anyone from answering the survey, even if they have never eaten fast-food before and do not intend on eating any in the future, even at vegan fast-food restaurants. Instead, the research protects against biases like this by asking whether the person has eaten fast-food before. This also helps with the main medium which is used in trying to garner as many respondents as possible: Usage of social media and the internet. While the internet is a great way to quickly reach a wide audience, this brings with it a slew of problems, which the research deals with as follows. In order to be able to sort out foreign responses, the survey asks respondents whether or not they are currently Dutch residents. In order to avoid multiple responses from the same individual, the programme blocks any device that was already used to answer and complete the survey previously. In order to avoid respondents skimming the research and avoid them from answering questions without knowing what it is about, this research excludes responses that are shorter than 3 minutes. As long as an individual has completely filled out all applicable socio-demographic questions with appropriate answers, the answers that that individual has given for questions will be included in the survey analysis, even if the individual did not complete the entire survey. If even one socio-demographic question is inappropriately filled in (such as filling in a question mark to the question "In what year were you born?"), the research considers the respondent to be invalid. This survey was open to anyone over the age of 16.

Veg*ans reportedly make up about 2.1% of the total population (Centraal Bureau voor de Statistiek, 2021) and this can cause issues for a survey held among 200 respondents, given that, for the survey to be representative for the country the survey would have to have around 4 veg*an respondents. Because this is not ideal numbers to analyse, the data was split and 2 separate analyses were conducted: one for veg*an respondents and one for non-veg*an respondents.

This survey distinguishes different age groups, genders, ethnicities, education levels, work experience and income groups to help avoid situations in which a group of individuals is being overrepresented in the survey and that causing the results to skew one way or the other. Each of these variables is established by their respective question. These socio-demographic groups will be categorised below. A translated version of the question will be included in between brackets. Italic answers are the variables as used in the analysis, answers in quotation marks are the options as they were presented to respondents.

- Age *("What is your birth year?")*

The respondent was asked for their birth year. This data was then translated into age groups in order to aggregate this data. The age groups are *16-19*, *20-29*, *30-39*, *40-49*, *50-59*, *60-69* and *70+*. Each individual in each respective category is expected to be the average age of that category, so someone in the 50-59 age group is expected to be 54,5 years old.

- Gender *("Are you: …")*

Gender is divided into *"male", "female"* and *"other"*. Other includes 1 respondent and is therefore not interpretable but for the purpose of this research it will not be included in or added to either category in order to review whether the gender has any significant influence.

- Ethnicity *("what is your descent?")*

Ethnicities in this research are defined by the question "where are you from?" which is open to interpretation. Ethnicities are defined as "the fact or state of belonging to a social group that has a common national or cultural tradition" and the interpretation that this question left open fits with the definition's openness to interpretation, as it is up to the person that answers what social group they belong to. That being said, due to the openness of the question there were many responses that were slightly different, such as the difference between "Suri", "Surinaamse" and "Surinaams", all of which were corrected to "Surinaams" in order to create less categories. In the case a respondent replied as being a mix of cultures, the most dominant one was chosen. This dominance was determined as follows: if the mix included the "domestic" ethnicity ("Nederlands"), then the dominant ethnicity was determined as the "foreign" ethnicity. If the mix included multiple "foreign" ethnicities, but one was

related to a culture and one to a country, then the dominant ethnicity was determined as the cultural ethnicity. Fortunately, this survey did not result in any "foreign" mix of country-ethnicities. All ethnicities are converted to dummy categories.

- Education level ("*Are you currently studying?"* and "*If not, have you received an education before?"*)

The most common education levels in the Netherlands are VMBO (and MBO), HAVO (and HBO) and VWO (and university). These respective categories will be labelled Low, Medium and High education, respectively. This research does not differentiate between respondents that have finished their respective studies and those who did not. In the case that a respondent has completed multiple studies, the research considers the highest ranked education level that it corresponds with. In the case that a respondent does not have any education, nor is pursuing one, this research considers them to be uneducated. This is the reference category.

- Work experience *("How many years of work experience have you gained up to now?")*

The years of work experience that an individual has gained is categorised into 5-year terms. "*Less than 5 years", "5-10 years", "10-15 years"*, and so on, with the last category being "*more than 40 years"*. For each individual in each respective category, it is assumed that they have had an average amount of work experience for that category. For example, someone that has had 5-10 years of work experience is expected to have had 7.5 years of work experience. For the edge cases the assumption is that an individual has had 2.5 years of experience if they answered *"Less than 5 years"* and 42.5 years of experience if they answered *"more than 40 years"*.

- Income *("What is your average yearly net income?")*

Income groups are similarly categorised into 20.000-euro segments and are defined as net yearly income as reported by the respondent. Similar to work experience the categories are averaged out, so someone that falls into the category *"20.000-40.000 euro"* is expected to earn 30.000 euro a year on average.

- Fast food frequency (*"Have you eaten fast food before?"* and *"How often do you eat fast food?"*)

If an individual has answered yes to the first question, they would receive the second question and their answer was recorded. The amount of fast food consumed was categorised by average frequency per month and average frequency per week. This gives the categories "*less than once a month", "1-2 times a month", "1-2 times a week", "3-4 times a week", "5-6 times a week"* and "*daily".*

- Veg*an (*"Do you eat...?"*)

If an individual's answer to the question excluded meat and fish, then the individual was considered veg*an. If not, the individual was considered non-veg*an.

- Veg*an food frequency (*"Do you eat...?"* and *"How often do you eat vegan food?"*)

If an individual answered that they have eaten meat-replacements or plant-based products before, they would receive the second question and their answer was recorded. The amount of vegan food consumed was categorised by average frequency per month and average frequency per week. This gives the categories "*less than once a month", "1-2 times a month", "1-2 times a week", "3-4 times a week", "5-6 times a week"* and "*daily".*

Analysis

To start the survey's analysis, let's take a look at the respondents that filled in the survey. Figures and tables are included in the appendix below. As mentioned before, the survey was filled in by 205 respondents. Of those 205, 165 were completed, 15 were incomplete but allowed as per the rules set by this research and 25 were disqualified based on those same rules. This leaves 180 surveys that could be properly interpreted on their socio-demographic variables.

Among the respondents the amount of male (86) and female (93) respondents were roughly equal (figure 5). The research did have 1 respondent that belonged in the "other" category, as mentioned before for the sake of the research this person will be excluded when it comes to gender. For the purposes of analysis of the data, gender was recoded to a nominal numeric variable, with 1 representing male and 0 as female. Other was excluded from being represented by means of a missing value.

Most respondents fell in the category 20-29 (54), while the other categories were somewhat similar in size. The only exception to that was the category "70+" which is expected of an online survey. Obviously the category "16-19" was going to feature less people (13) than the other categories because the category simply has less possible responses linked to it, however, percentually the category should still hold about 40% of the average of other categories which seems about right (the average of the categories 30-39 to 60-69 is 26,5 which would amount to about 11 responses). An age radar that includes the full range rather than the categories is included in the appendix below (figure 6).

Respondents were mostly Dutch native (100), Surinamese (48), or Hindustani (15), with a plethora of other ethnicities mixed in (figure 7.1). All respondents' ethnicities were grouped by continent (except for Dutch natives) in order to better interpret the data. A separate figure was included in the appendix

(figure 7.2). This variable (Grouped Ethnicity) contained respondents from Asia (21), Africa (5), Latin-America (49) and foreign Europeans (5), as well as the aforementioned 100 Dutch natives.

In the survey the questions determining the education level of respondents did initially separate current students and respondents with completed educations. In the research analysis however, this difference will not be included. Neither will there be a separation between respondents that have completed VWO and those who have completed WO for example. Both of these respondents are classified as having received high education. LBO, VMBO and MBO are classified as low education, while HAVO and HBO are classified as medium education. A figure is included detailing the disparity between variable levels in the appendix below (figure 8).

Income brackets were transformed into single integers representing the means of the bracket (figure 9). Low income brackets (10.000 euro (61) and 30.000 euro (63)) represented over two thirds of all respondents, while high income brackets (110.000 euro (3) and 130.000 euro (5)) represented less than 5 percent of respondents. Given CBS' research into the standardised income for Dutch households, this is relatively high for the Netherlands where the data for incomes beyond 100.000 euro weren't even included in the figure and incomes between 80.000 and 100.000 span a total of 1.8% (Centraal Bureau voor de Statistiek, 2022).

Given that the survey featured mostly respondents aged 20-40 it is no wonder that the largest group of respondents (44) in the category work experience had less than 5 years of work experience to boot. Among the current workforce (people that answered "Ja" to the question "Bent u op dit moment werkzaam?"), 5 years of work experience was less obviously the biggest group (32) but sizeable nonetheless. The smallest group was the group with 30-35 years of work experience (both current workforce (3) and total work experience (5)). Both variables are included in figure 10 in the appendix below, although this research will focus on the total work experience.

Among all participants, about 22% were "veg*an" (40, according to their diet as indicated by the respondent not checking the answers "Meat" and "Fish" to the question "Do you eat...?"). Of those, 6 respondents answered to also not consume any animal products, indicating that they are vegans. 34 respondents are vegetarian. The remaining participants belong to the category "non-veg*ans" (140). See the appendix below for the accompanying figure (figure 11).

Among all respondents, the most replied frequency was 1-3 times a month (79), followed by less than once a month (66). No respondent answered to frequent a fast-food place more than 4 times a week, while 2 respondents replied to never frequent a fast-food place (figure 12).

Vegan frequency (figure 13), or how often respondents tend to eat meat-replacements (or plant-based options) was more diverse. A small subset of respondents (8) replied to eat meat-replacements daily, while the largest group of respondents (63) replied to never eat meat-replacements. However, the respondents were more evenly divided among the categories in between than reported in fast-food frequency.

In order to analyse the data, the research used JMP. In Excel, the data was sorted and refined, then the data was split in two. In JMP, both choice profile data sheets were imported and analysed, first without any socio-demographic variables. The outcomes are shown in the appendix below. For all significances, a p-value of 0,05 (or smaller) was assumed as the threshold.

While *Number_of_people* and *Company* seem to have no significant effect on the preferences of both non-veg*an and veg*an respondents (table 3 and 7 respectively), the veg*an respondents also seem to experience no significant effect of *Caloric_value* on their preferences. Of course, this could have to do with the fact that the model includes too many insignificant variables. For those reasons, the least significant variables were removed from each of the tables, one by one.

Removing *Company* and *Number_of_people* as a factor for non-veg*ans doesn't seem to change much (table 6), however, removing *Caloric_value* and *Number_of_people* transforms *Company* into a significant factor for the preferences of veg*ans (table 9). To make sure that *Company* is indeed the significant factor, the other two scenarios were created by removing *Company* first and seeing if one of the other two could become a significant factor. This didn't work, and neither did removing another insignificant factor from the table afterwards. Therefore, *Company* seems to be a significant factor for the preferences of veg*ans.

However, the socio-demographic variables need to be observed in order to determine if any of these variables are significant themselves or if they are correlated with a respondent's characteristic. Were the variables previously found insignificant, the interaction effect with the socio-demographic variables might prove these variables significant nonetheless. Therefore, these variables are included in the demographic analyses.

Gender had no significant interaction effects on any of the variables initially (table 10 and 12). Removing insignificant variables bottom-up revealed that gender had significant interaction effects on *Cleanliness* and *Ingredients* for non-veg*ans (table 11.3). The interaction effect between *Company* and gender looked promising (0,074, see table 11.1) and given that *Company* was still represented in the table it could have been the case that, if that factor was removed, the variable was significant. However, it turns out that is not the case; *Company* remains an insignificant factor for non-veg*ans. On the veg*an side, the analysis was interesting. Initially, the interaction effects with price, waiting

time and cleanliness are all towards the bottom and look like they'd be prime suspects for removal. After removing insignificant variables bottom-up though, not a singular variable turned out significant. To check whether any interaction effects were left out too soon, those variables were added back and after another bottom-up removal process, it turns out gender had a significant interaction effect with *Cleanliness* for veg*ans.

Initially, age had significant interaction effects with *Waiting_time* and *Price* for non-veg*ans. As insignificant variables were removed, one interesting variable was found in the interaction effect between age**Caloric_value* . This variable was then identified as significant upon the removal of the variable *Caloric_value* (table 15.2). It seemed that this interaction effect also deemed that *Number_of_people* was significant and that *Waiting_time* no longer had significant interaction effects with age. When this interaction effect was removed however, that variable (*Number_of_people)* was no longer significant and *Waiting_time* reappeared as significant. For veg*ans, the interaction effects of both *Caloric_value* and *Company* looked promising, however upon removing the *Caloric_value* and *Company* and any insignificant variables bottom-up after that, neither proved to be significant. What remained was an interaction effect between age and *Cleanliness*, *Number_of_people*, *Carbon_footprint* and *Waiting_time* (table 17.3).

The variable grouped ethnicity was initially not significant whatsoever except for grouped ethnicity by *Ingredients* for non-veg*ans (table 18). After digging through the insignificant variables and removing base variables where applicable to check if interaction effects were significant, this was exactly what was found for non-veg*ans (table 19.5). For veg*ans, it turned out that grouped ethnicity had an interaction effect with *Cleanliness* (table 21.5).

Education is significantly interacting with *Cleanliness*, *Waiting_time*, *Price* and *Carbon_footprint* for non-veg*ans (table 23.4). Despite the interaction effect with *Number_of_people* looking promising, the variable was just short of being significant after the bottom-up removal of insignificant variables (table 23.3). For veg*ans, the same variable also looked promising and also turned out to be insignificant after the bottom-up removal process (table 25.3). The remaining significant interaction variables are *Cleanliness* and *Waiting_time*.

Work experience was a lot simpler, at least for the non-veg*an analysis. The interaction effects that looked promising ended up significant and the interaction variables that did not, were found to be insignificant after the bottom-up removal process (table 27). The remaining significant interaction variables were *Ingredients* and *Company*. On the veg*an side, the analysis was more complicated. In order to even obtain values for this variable, the research had to turn off Firth-Bias adjusted estimate. This setting supposedly helps against biases in a large sample, however can quickly turn small sample

estimates to zero, indicating that they have no effect whatsoever. What is interesting about this setting is that this error did not occur up to this point, which is interesting given that some variable levels were much smaller across both datasets (an example would be fast-food frequency, with some levels having only a singular answer). Not just that, the removing process caused the variables to jump all over the place. Some that were initially deemed insignificant would end up significant (such as work experience by *Price* (table 29.1 and 29.3)) and some that initially looked promising (or at least, as promising as it could get) were found to be insignificant in the end (such as the interaction effect with *Waiting_time* (table 28)).

Income was even simpler and this time for both sides. On the non-veg*an side, the interaction effects worth mentioning were income and *Ingredients* and income and *Cleanliness* (table 31). On the veg*an side, the effect worth mentioning was income and *Cleanliness* (table 33). While *Cleanliness* was originally flanked by *Price*, *Waiting_time* and *Caloric_value*, once the lower interaction effects disappeared off the table, the table rankings quicky dropped for those variables.

Fast food frequency was one of those variables that had variables jump all over the table with every insignificant variable removed. Eventually the significant interaction variables for non-veg*ans turned out to be *Carbon_footprint*, *Price*, *Waiting_time*, *Ingredients* and *Caloric_value* in their interaction with fast food frequency (table 35.3). For veg*ans, the significant interaction variables were found to be *Waiting_time* and *Price* (table 37.4).

Vegan frequency proved even more difficult. Not only did both datasets have to have the Firth-Bias adjusted estimate turned off in order to even obtain any values, the variables also kept jumping up and down the tables on both sides. Non-veg*an significant interaction effects were *Carbon_footprint*, *Waiting_time*, *Price*, *Number_of_people*, *Caloric_value* and *Ingredients* (table 39.4). Veg*an significant interaction effects were *Price*, *Ingredients*, *Waiting_time* and *Cleanliness* (table 41.5).

In order to assess which interaction effects actually had any effects on the data sets, the interaction variables and all standard variables were thrown into two final analyses. One analysis was using the Firth-Bias adjusted estimate and excluded any variables that would be affected by this, the other would turn off the Firth-Bias adjusted estimate and include all variables. This was done for both datasets. These interaction effects tell us that the data could be biased, but even among these interaction variables, some variables were found to be significant.

The final significant values excluding interaction effects were found to be:

- None for non-veg*an all variables except vegan frequency (table 42.2)
- *Waiting_time, Carbon_footprint*, *Price* and *Cleanliness* for non-veg*an all-variables Firth-Bias adjusted estimate turned off (table 43.2)
- *Carbon_footprint*, *Ingredients*, *Cleanliness*, *Price* and *Company* for veg*an all variables except work experience/vegan frequency (table 44.2)
- *Carbon_footprint*, *Ingredients*, *Cleanliness*, *Price* and *Company* for veg*an all-variables Firth-Bias adjusted estimate turned off. (table 45.2)

Ingredients and *Company* both need to be clarified, as it is not clear without proper explanation what level the consumer would prefer. For Ingredients, the veg*an consumer has a strong preference for plant-based products, being 3 times as likely to be chosen as meat-replacement and over 76 times as likely to be chosen as meat (figure 36). This makes sense given that both vegans and vegetarians have a lifestyle that actively avoids eating meat. The preferred company is McDonalds, with similar chances of being chosen over Subway but significantly less marginal utility (figure 37). This indicates that *Company* is simply something that the average veg*an consumer does not consider as heavily as they would *Ingredients*.

Results
With this in mind, the hypotheses can be concluded as follows:

- ~~H1: Company loyalty is a significant purchasing criterion for the Dutch fast-food consumer.~~

False: Company loyalty is not a significant purchasing criterion for non-veg*an fast-food consumers.

- H2: Company loyalty is a significant purchasing criterion for the Dutch veg*an fast-food consumer.

True: According to the fourth full analysis (table 45.2), with Firth-Bias adjusted estimate turned off, Company loyalty is a significant purchasing criterion for the Dutch veg*an fast-food consumer, with the likelihood of a consumer choosing McDonalds being almost 3 times as high as the likelihood of the consumer choosing Subway (figure 37).

- H3: On average, the utilitarian variables are more significantly influencing the average fast-food consumer in the Netherlands than the hedonic variables

True: While both analyses do show that there is insufficient proof to claim that caloric_value is a significant purchasing criterion of the Dutch non-veg*an fast-food consumer, the other variables were all found to be significant (table 43.2). On the other hand, the only significant hedonic variable was

found to be *Cleanliness*. This makes the utilitarian variables more significant in influencing the purchasing behaviour for the Dutch non-veg*an fast-food consumer. Moreover, the Likelihood-Ratio test (figure 33) shows that cleanliness has the lowest estimated effect of all 4 variables.

- H4: On average, the hedonic variables are more significantly influencing the average veg*an fast-food consumer in the Netherlands than the utilitarian variables

Inconclusive: For the same reason that the other hypothesis was found to be true, this variable initially looks true too. The Firth-Bias adjusted estimate analysis shows three hedonic variables *(Ingredients, Cleanliness* and *Company)* as well as two utilitarian variables. Meanwhile the non-Firth-Bias adjusted estimate analysis shows that *Ingredients* (hedonic) and *Price* (utilitarian) are insignificant purchasing criteria of the Dutch veg*an fast-food consumer. In both analyses the number of hedonic variables outnumber the utilitarian variables. However, a closer inspection of the Likelihood-Ratio tests displays that *Carbon_footprint* has a much larger effect on the outcome than any of the other variables with Firth-Bias adjusted estimate turned off (figure 35). With Firth-Bias adjusted estimate turned on, the effect of *Ingredients* approaches *Carbon_footprint* (figure 34). Therefore it's difficult to state that, on average, the effect of hedonic variables are more significantly influencing the Dutch veg*an fast-food consumer than utilitarian variables.

- H5: *Waiting_time* is more significantly influencing the average fast-food consumer in the Netherlands than the average of the hedonic variables.

True*: *Waiting_time* is indeed larger than *Cleanliness* according to the Likelihood Ratio test (figure 33). However, it's difficult to say if *Waiting_time* would be more significantly influencing the average fast-food consumer than the average of the hedonic variables. Nevertheless, *Cleanliness* was the only significant hedonic variable found for the Dutch non-veg*an fast-food consumer, which would indicate that the average of the hedonic variables would have likely been insignificant.

- H6: The average of the hedonic variables is more significantly influencing the average veg*an fast-food consumer in the Netherlands than *Waiting_time*.

True: While the average of the hedonic variables remained inconclusive, at least there were hedonic variables that turned out to be significant. On the other hand, in none of the analyses did *Waiting_time* prove to be a significant purchasing criterion for the Dutch veg*an fast-food consumer.

- H7: *Caloric_value* ~~and *Carbon_footprint*~~ are NOT significant purchasing criteria for the Dutch fast-food consumer.

True and false respectively: While *Caloric_value* did not prove significant in either analysis for the Dutch non-veg*an fast-food consumer, *Carbon_footprint* did prove to be significant (table 43.2).

- H8: ~~*Caloric_value* and~~ *Carbon_footprint* are significant purchasing criteria for the Dutch veg*an fast-food consumer.

False and true respectively: While *Caloric_value* did not prove significant in either analysis for the Dutch veg*an fast-food consumer, *Carbon_footprint* did prove to be significant in both analyses.

- H9: Eating together is NOT a significant purchasing criterion for the Dutch fast-food consumer.
- ~~H10: Eating together is a significant purchasing criterion for the Dutch veg*an fast-food consumer.~~

True and false, respectively: Eating together is not a significant purchasing criterion for any Dutch fast-food consumer, no matter which dataset or analysis.

Conclusion

To answer the main research question: *"What buying criteria does the Dutch fast-food consumer consider when choosing between the McPlant from McDonalds and the Vegan Patty from Subway, given the trend sensitivity of non-meat options, and how does that differ from the buying criteria of the vegan Dutch fast-food consumer?"*, the following questions were posed:

1. What are the buying criteria that fast-food consumers depend on when making decisions?
2. What are the buying criteria that vegan fast-food consumers depend on when making decisions?
3. Does the Dutch fast-food consumer consider them as well and if so, how important are they in determining the outcome?
4. Does the vegan Dutch fast-food consumer consider them as well and if so, how important are they in determining the outcome?

Questions 1 and 2 were answered in the theoretic framework and their respective buying criteria were used as variables during the survey.

- ♦ To summarise the final questions and correctly formulate the model discussed in the theoretic framework:

Question 3: Does the Dutch fast-food consumer consider them as well and if so, how important are they in determining the outcome?

Carbon_footprint was found to be the most significant factor as per the Likelihood-Ratio test (figure 33), followed by *Price, Waiting_time* and *Cleanliness*, respectively. The other factors were deemed

uninterpretable due to correlations with socio-demographic variables. This gives the following formula:

$$Y_1 = A_1 \cdot \alpha + B_1 \cdot \beta + C_1 \cdot \gamma + G_1 \cdot \theta + \varepsilon$$

A be the variable of *Waiting_time* and α be the coefficient with which A increases or decreases Y;
B be the variable of *Price* and β be the coefficient with which B increases or decreases Y;
C be the variable of *Cleanliness* and γ be the coefficient with which C increases or decreases Y;
G be the variable of *Carbon_footprint* and θ be the coefficient with which G increases or decreases Y;
1 be the Dutch fast-food consumer and 2 be the Dutch veg*an fast-food consumer;
ε be the error term.

- Question 4: Does the vegan Dutch fast-food consumer consider them as well and if so, how important are they in determining the outcome?

Carbon_footprint was found to be the most significant factor as per the Likelihood-Ratio test (figure 35), followed closely by *Ingredients* and distantly by *Cleanliness*, *Price,* and *Company* respectively. This makes sense, as a veg*an would most likely care about not eating meat (but not necessarily caring about whether a product is plant-based or not) and about the carbon footprint of the product they are consuming. The hygiene of a place, price and what company sells it would be of secondary importance. With the Firth-Bias adjusted estimate turned off, the variables *Work_experience* and *Vegan_frequency* could be interpreted. Neither of these ended up being significant, but in this model Ingredients and *Price* were deemed insignificant. This could be due to the Firth-Bias adjusted estimate being turned off, or due to a possible interaction effect between the variables. The other factors were deemed uninterpretable due to correlations with socio-demographic variables. This gives the following formula:

$$Y_2 = B_2 \cdot \beta + C_2 \cdot \gamma + E_2 \cdot \zeta + F_2 \cdot \eta + G_2 \cdot \theta + \varepsilon$$

B be the variable of *Price* and β be the coefficient with which B increases or decreases Y;
C be the variable of *Cleanliness* and γ be the coefficient with which C increases or decreases Y;
E be the variable of *Company* and ζ be the coefficient with which E increases or decreases Y;
F be the variable of *Ingredients* and η be the coefficient with which F increases or decreases Y;
G be the variable of *Carbon_footprint* and θ be the coefficient with which G increases or decreases Y;
1 be the Dutch fast-food consumer and 2 be the Dutch veg*an fast-food consumer;
ε be the error term.

Discussion

Like most other research, this research is limited by the most common factors – time, money, geographical location, a researcher's personal reach to name a few. Despite this, the research does a decent job attempting to keep the research free of any biases. The presence of socio-demographic factors such as age and gender in the survey make it less likely for any research variable to be systematically skewed one way or the other. The survey being online makes it more accessible and at the same time less likely for respondents to actually complete their survey form. It also risks excluding the older age groups that are less experienced with technology as well as those that are disconnected among (young) adults. It also risks the survey being filled in multiple times by the same respondent (although steps were taken to minimise the risk of occurrence) and the likelihood of respondents communicating their answers, possibly skewing answers if multiple respondents answered simultaneously. Of course, the survey is as accurate as the respondents; if respondents have lied about any of the data or have skimmed over some of the questions then the research and its outcomes could be flawed. Despite this all, the research is a significant step forward for Dutch research into this particular topic, seeing as the research is not only done with an extensive amount of socio-demographic variables but also because prior research on this topic is limited. Going forward, the data could be extended beyond the researcher's personal reach and allow for a more diverse background of respondents. Particularly, Dutch respondents originating from other parts of the world than Surinam and India could provide the existing research with more and/or new perspectives. Alternatively, the research could be extended to other sources of veg*an fast-food, such as regular veg*an restaurants or pre-packaged foods found in supermarkets for example.

Appendix

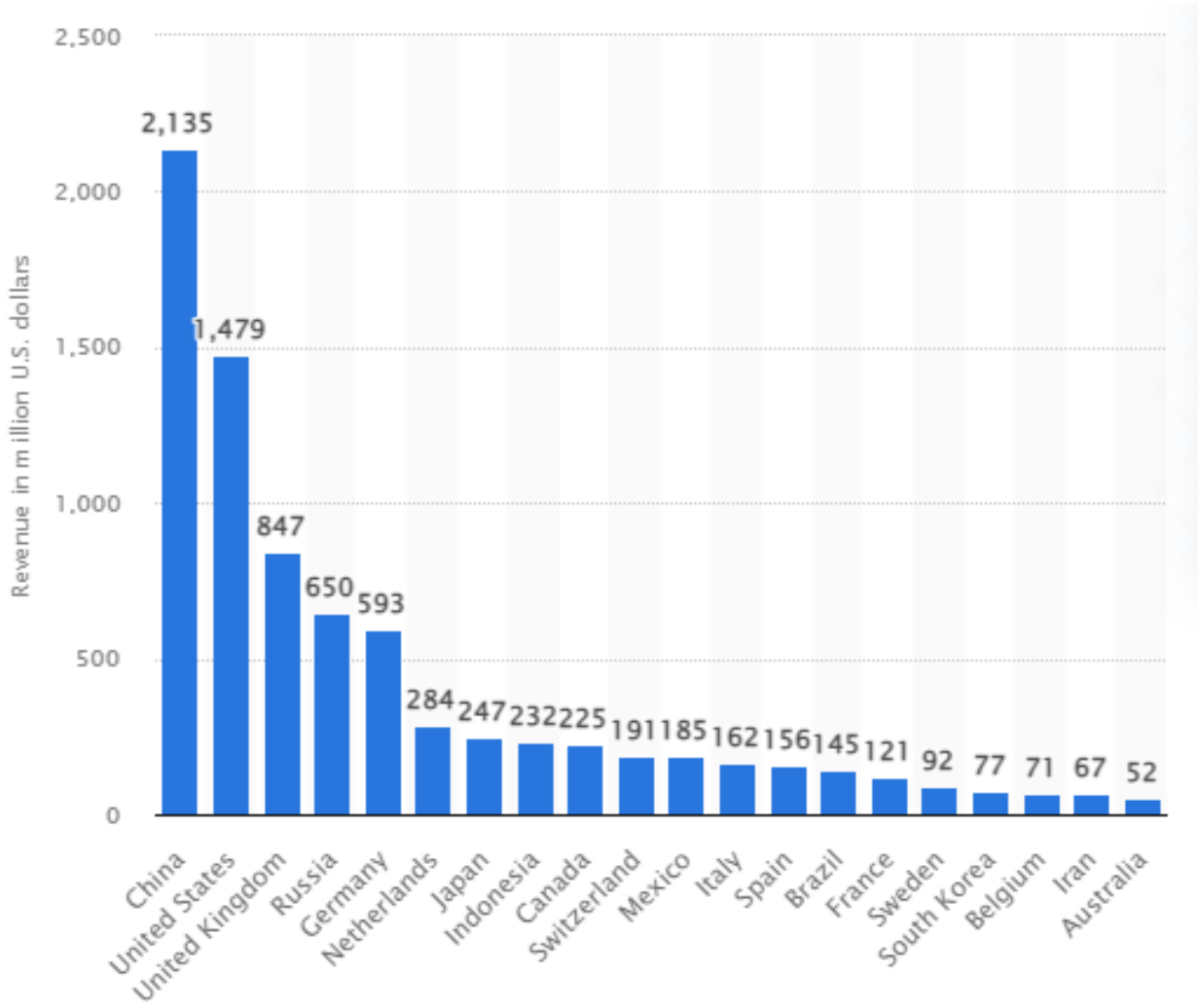


Figure 1: Worldwide meat substitute revenue in 2022, by country – in million U.S. dollars (Statista, 2021)

Table 1: Calculation for revenue per capita in 2022, by country – in U.S. dollars (population in millions (worldometer, n.d.))

Country	**CHN**	**USA**	**GBR**	**RUS**	**GER**	**NLD**	**JAP**	**IDN**	**CAN**	**SWZ**
Revenue	2135	1479	847	650	593	284	247	232	225	191
Pop.	1439,3	331	67,9	145,9	83,8	17,1	126,5	273,5	37,7	8,7
Rev. per capita	1,483	4,468	12,474	4,455	7,076	16,608	1,953	0,848	5,968	21,954
Country	**MEX**	**ITA**	**ESP**	**BRA**	**FRA**	**SWE**	**KOR**	**BEL**	**IRN**	**AUS**
Revenue	185	162	156	145	121	92	77	71	67	52
Pop.	128,9	60,5	46,8	212,6	65,3	10,1	51,3	11,6	84	25,5
Rev. per capita	1,435	2,678	3,333	0,682	1,853	9,109	1,501	6,121	0,798	2,039

Table 2: All variables and levels for the JMP survey

Variables	**Categories**									
Time to prep	3 minute		4 minutes		5 minutes		6 minutes		7 minutes	
Caloric value	403				420				520	
Carbon footprint	0,29	0,46	1,00	1,50	2,00	2,50	3,00	3,50	4,00	4,46
Price	3,55		3,95		4,55		4,95		5,55	
Company			McDonalds				Subway			
Ingredients	Meat				Meat-replacement				Plant-based	
Cleanliness	Kitchen 1				Kitchen 2				Kitchen 3	
# of people	1		2		3		4		>4	

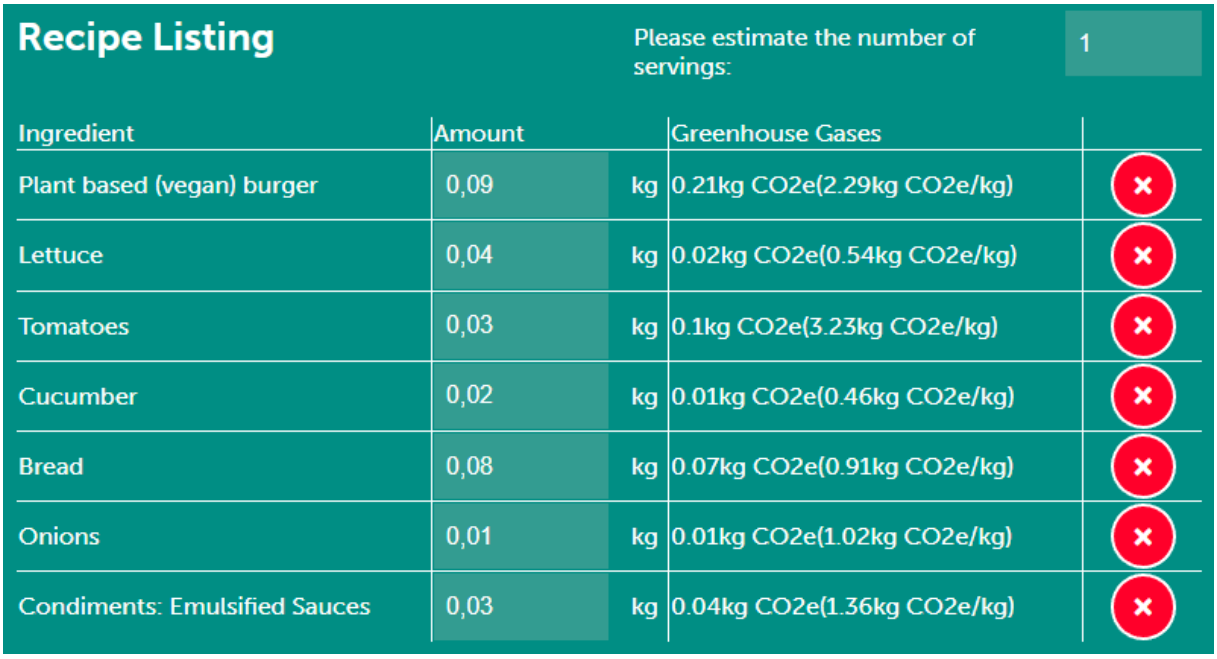


Figure 2: Subway's vegan burger ingredients filled in on the website Plate up for the Planet

Figure 3.1: Kitchen 1 (clean kitchen)

Figure 3.2: Kitchen 2 (messy kitchen)

Figure 3.3: Kitchen 3 (dirty kitchen)

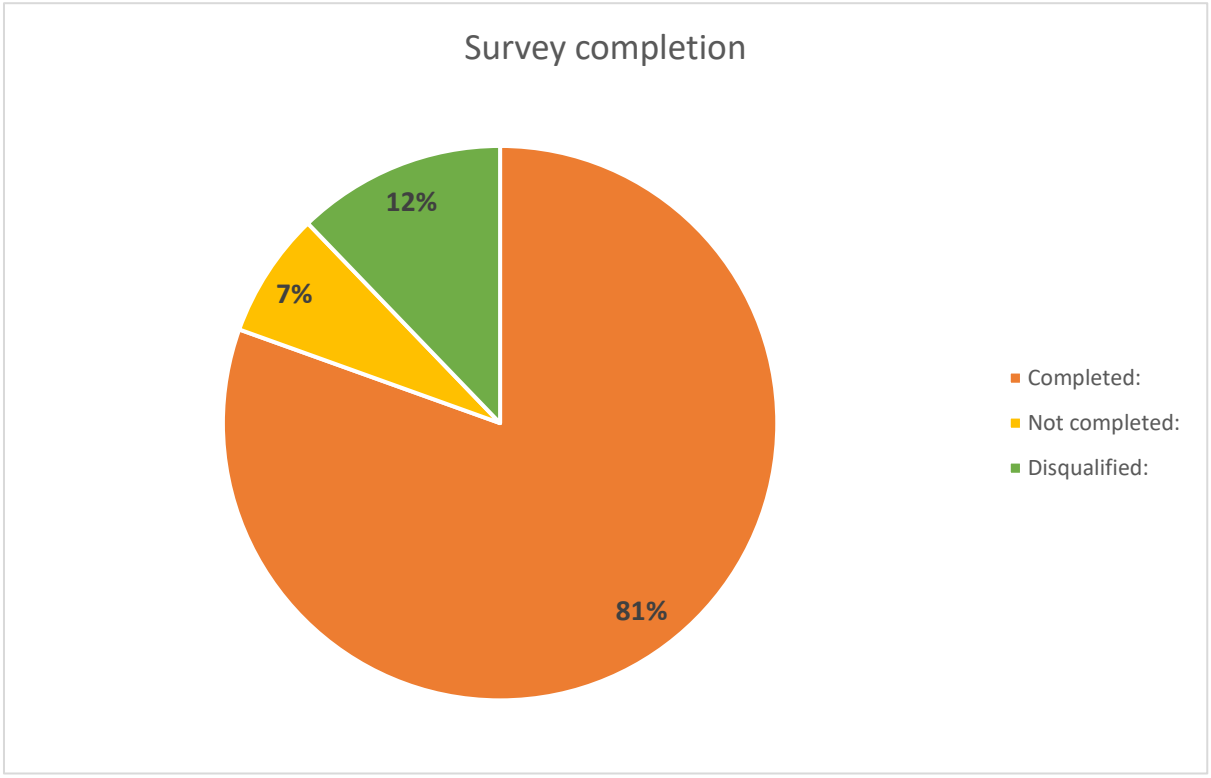


Figure 4: Survey completion

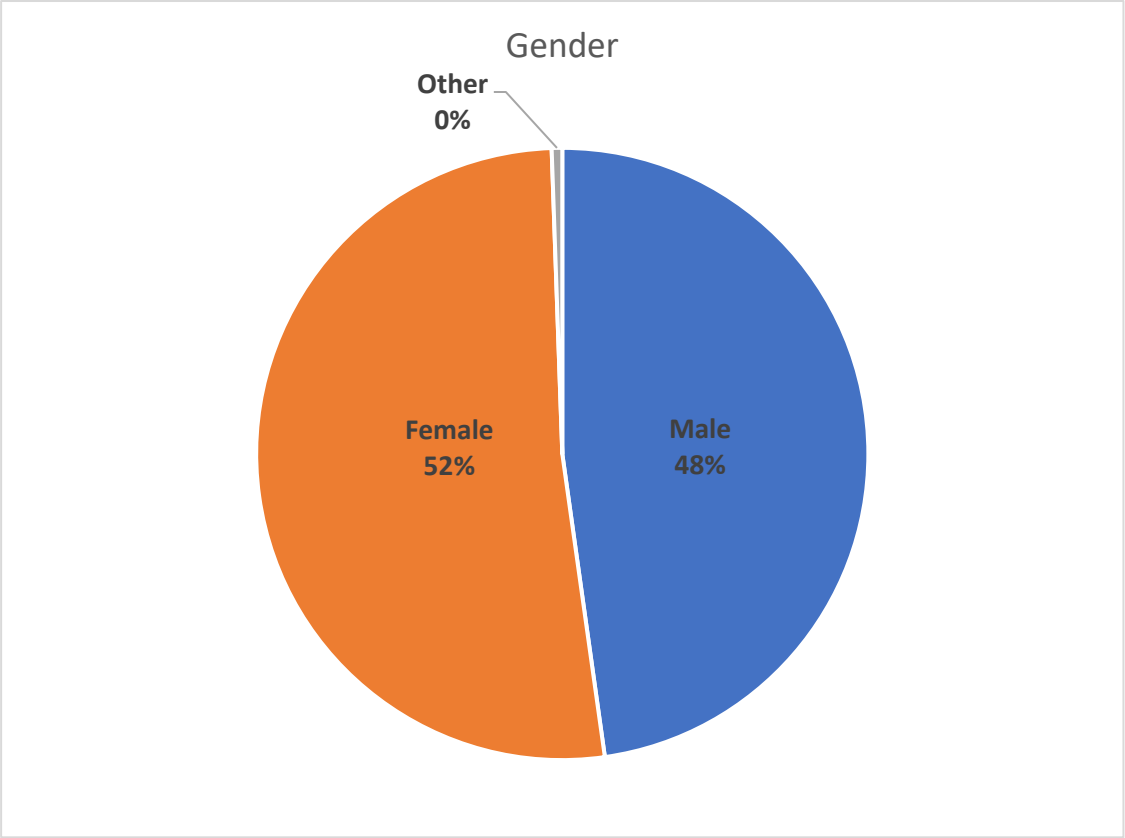


Figure 5: gender among non-disqualified respondents

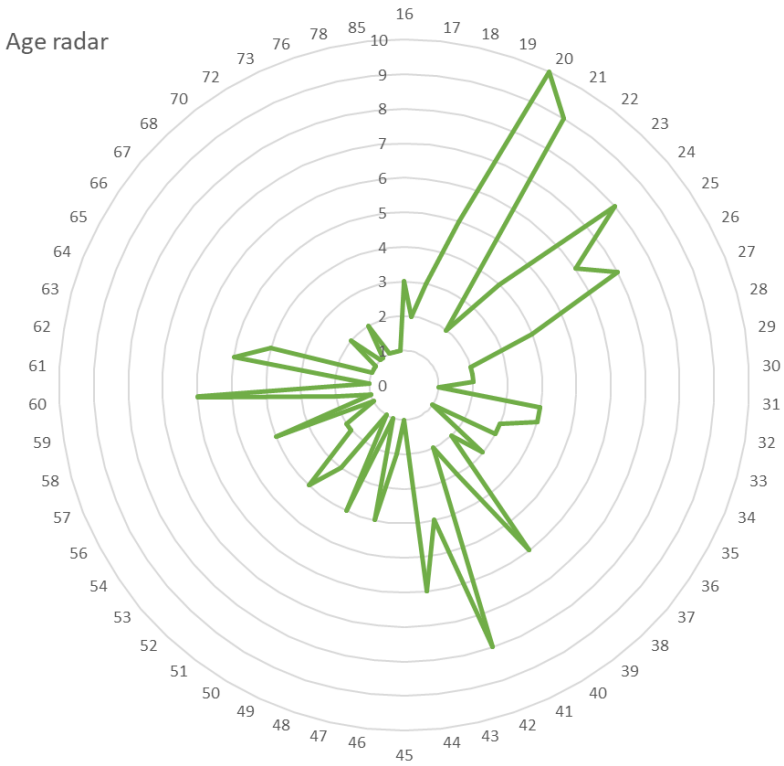


Figure 6: Age radar among respondents

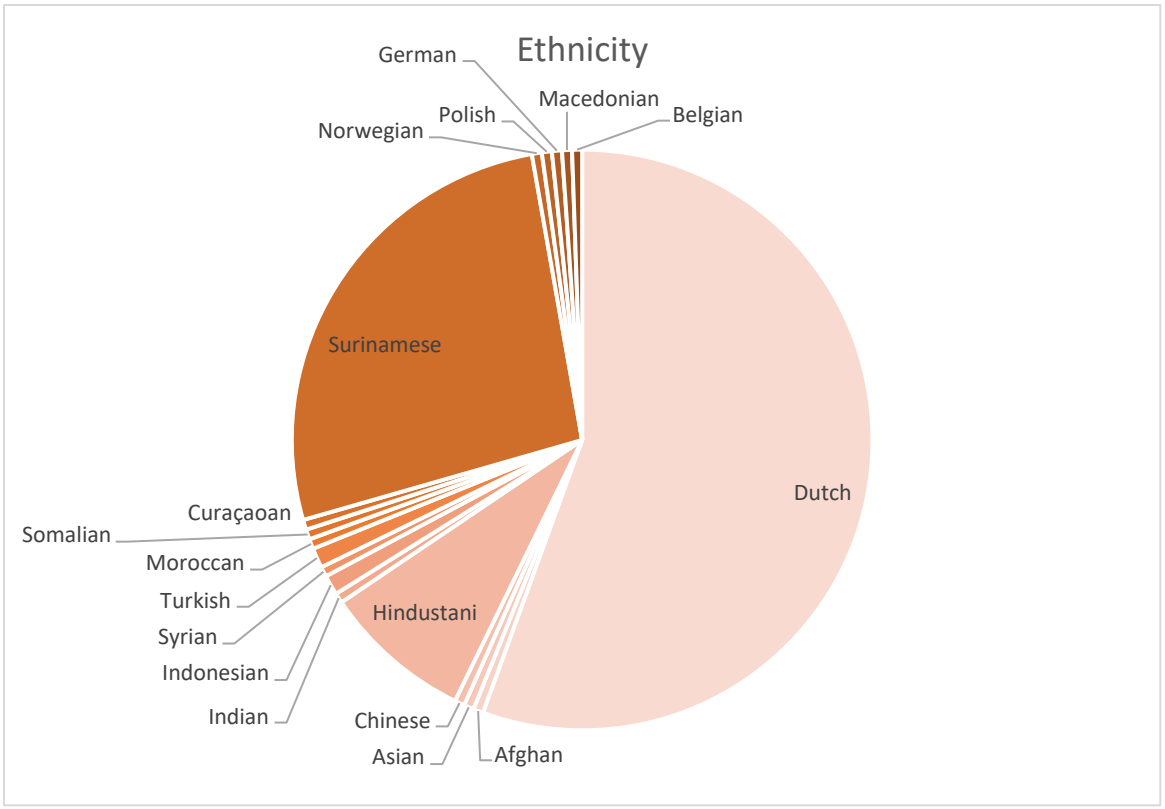


Figure 7.1: Ethnicity among respondents

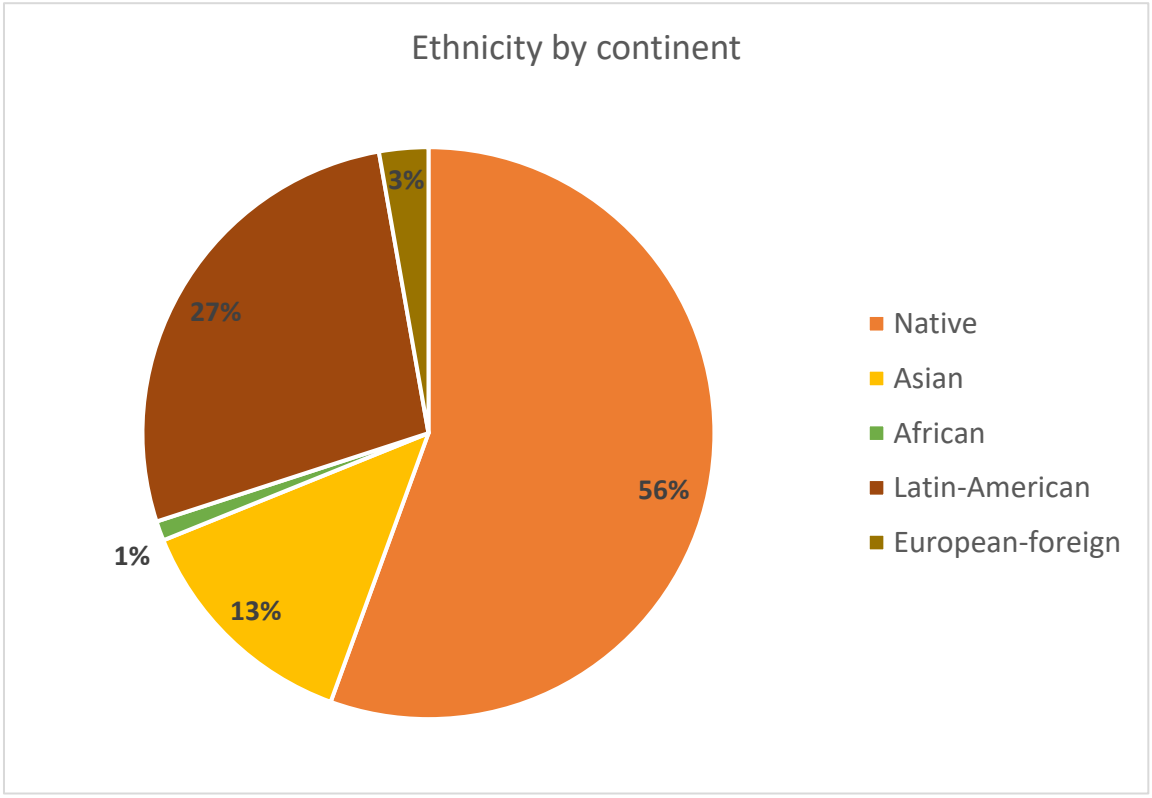


Figure 7.2: Ethnicity grouped by continent

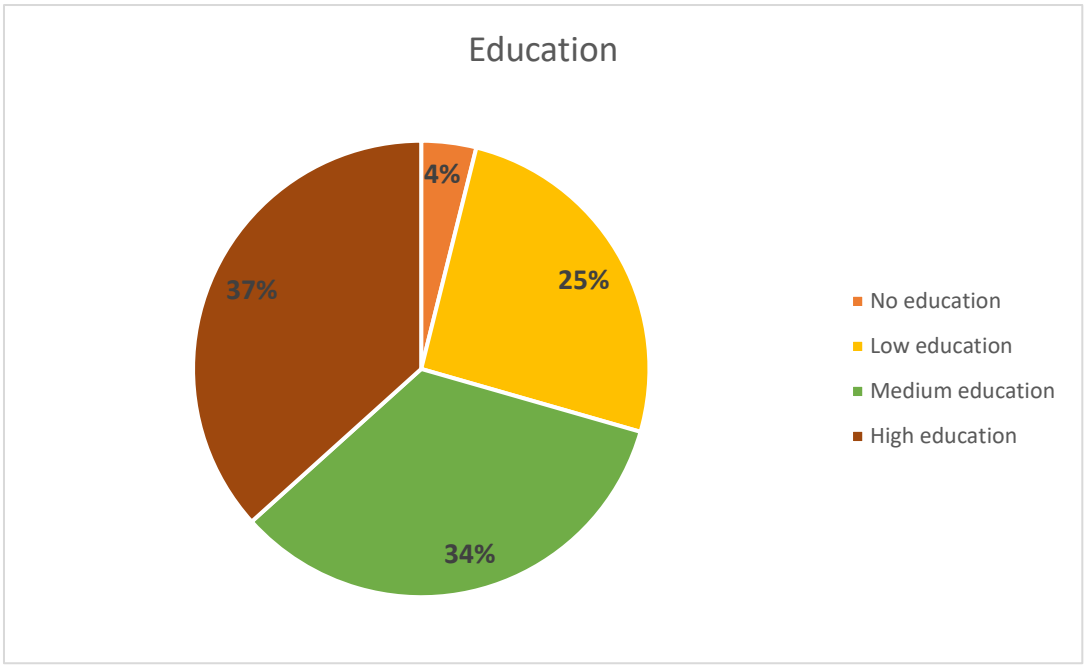


Figure 8: Education among respondents

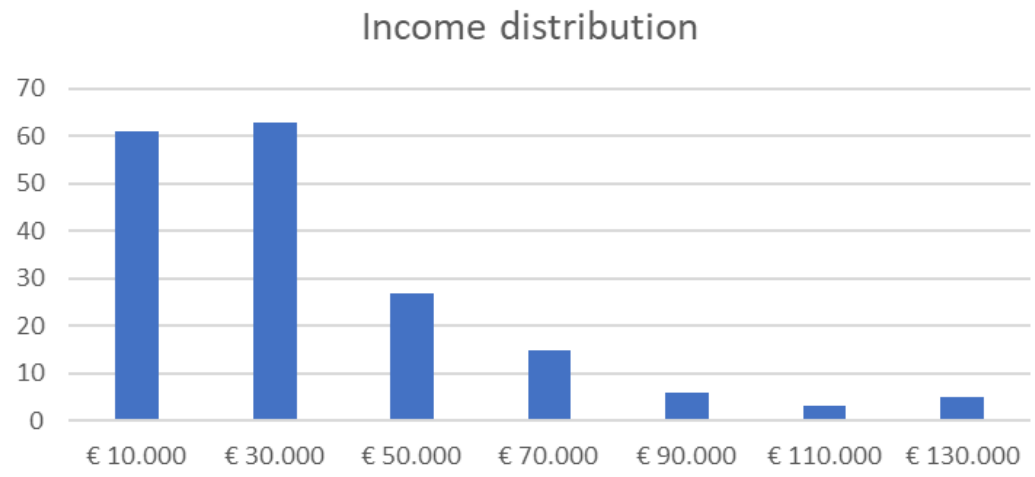


Figure 9: Income distribution among respondents

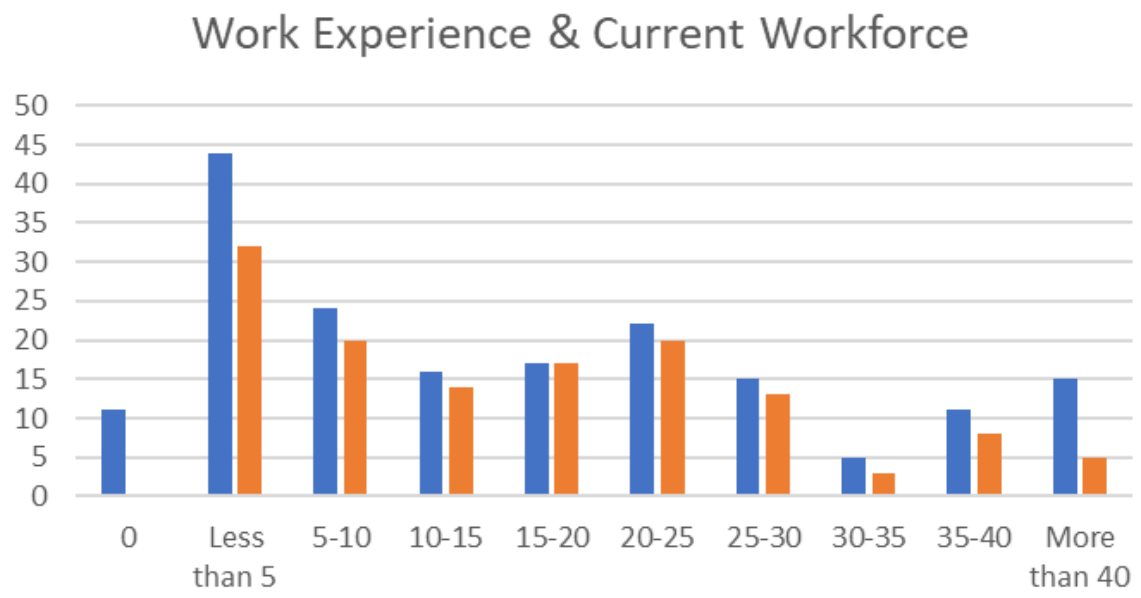


Figure 10: Work experience & current workforce

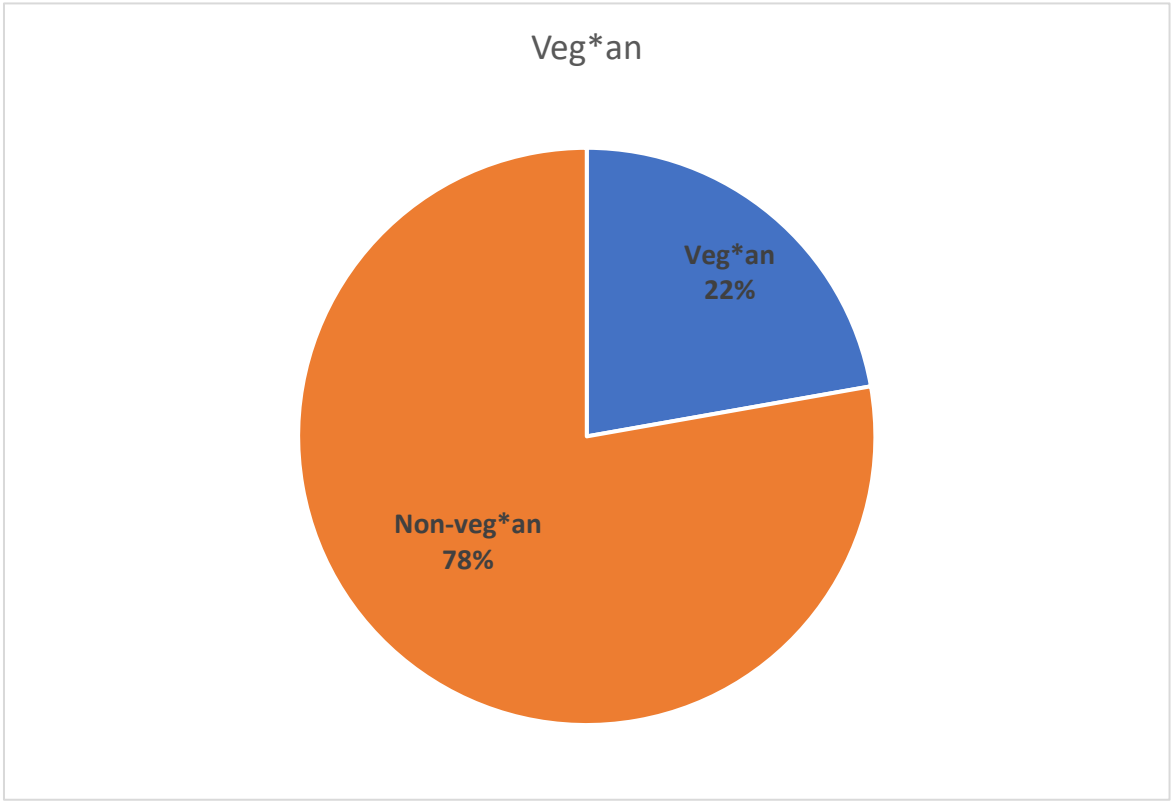


*Figure 11: Veg*ans among respondents*

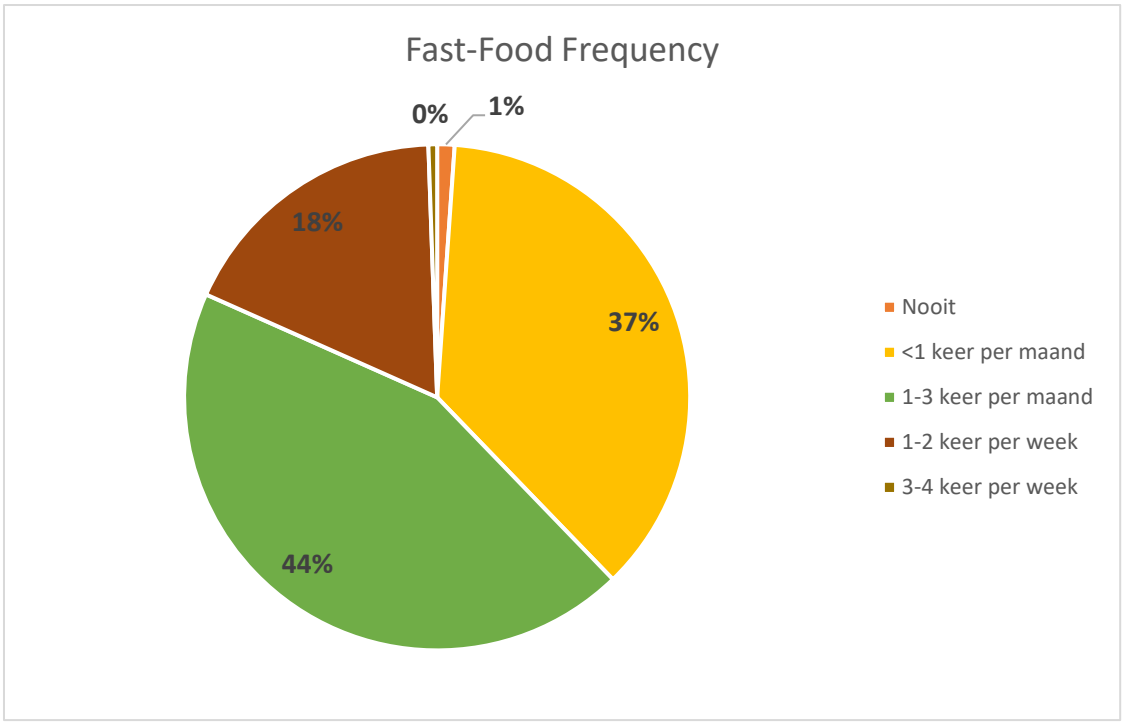


Figure 12: Fast-Food Frequency of respondents

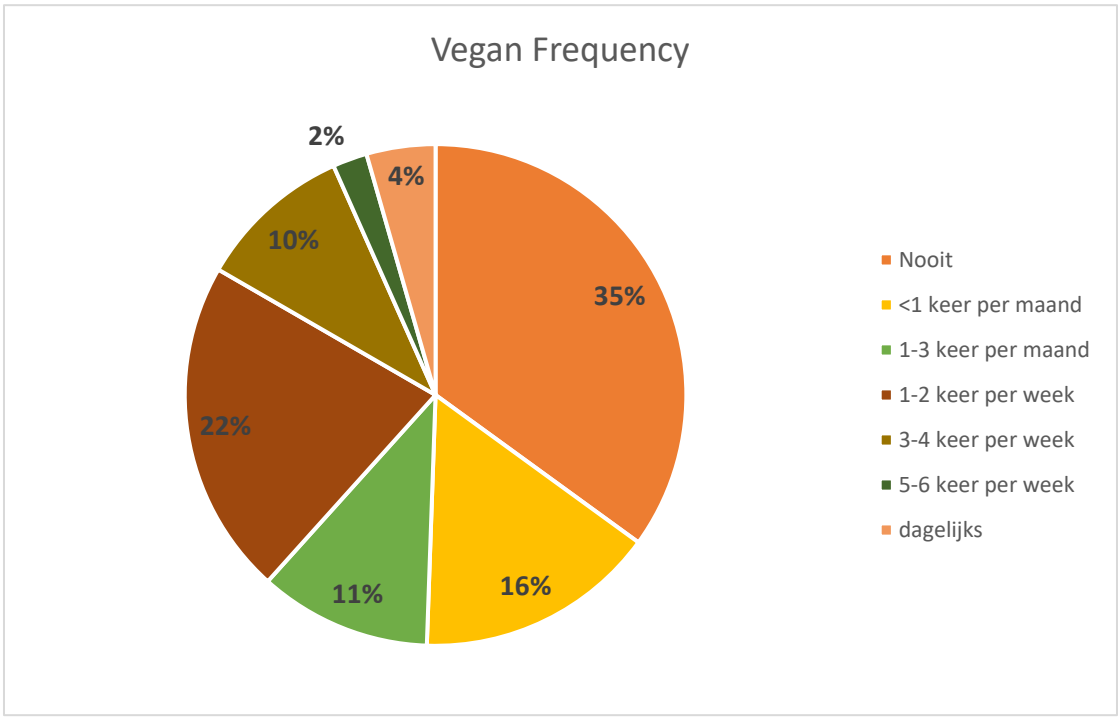


Figure 13: Vegan Frequency of respondents

*Table 3: Non-veg*an ordinal analysis*

Source	LogWorth	PValue
Carbon footprint	67,393	0,00000
Cleanliness	56,570	0,00000
Waiting time	22,273	0,00000
Price	20,650	0,00000
Ingredients	7,069	0,00000
Caloric value	1,552	0,02808
Number of people	0,638	0,23006
Company	0,533	0,29319

Likelihood Ratio Tests

Source	L-R ChiSquare	DF	Prob>ChiSq
Waiting time	110,633	4	<,0001*
Price	103,020	4	<,0001*
Cleanliness	260,514	2	<,0001*
Caloric value	7,146	2	0,0281*
Company	1,105	1	0,2932
Ingredients	32,556	2	<,0001*
Carbon footprint	341,473	9	<,0001*
Number of people	5,612	4	0,2301

*Figure 14: Likelihood Ratio Test results of non-veg*an ordinal analysis*

*Table 5: Non-veg*an ordinal analysis sans company*

Source	LogWorth	PValue
Carbon footprint	67,385	0,00000
Cleanliness	56,422	0,00000
Waiting time	22,475	0,00000
Price	20,610	0,00000
Ingredients	8,727	0,00000
Caloric value	1,558	0,02767
Number of people	0,698	0,20044

*Table 6: Non-veg*an ordinal analysis significants only*

Source	LogWorth	PValue
Carbon footprint	68,996	0,00000
Cleanliness	58,053	0,00000
Waiting time	22,682	0,00000
Price	20,540	0,00000
Ingredients	8,027	0,00000
Caloric value	1,541	0,02881

*Table 7: Veg*an ordinal analysis*

Source	LogWorth	PValue
Carbon footprint	57,160	0,00000
Ingredients	43,185	0,00000
Cleanliness	8,256	0,00000
Price	8,104	0,00000
Waiting time	7,809	0,00000
Company	1,115	0,07665
Number of people	0,806	0,15620
Caloric value	0,297	0,50508

Likelihood Ratio Tests

Source	L-R ChiSquare	DF	Prob>ChiSq
Waiting time	42,150	4	<,0001*
Price	43,571	4	<,0001*
Cleanliness	38,022	2	<,0001*
Caloric value	1,366	2	0,5051
Company	3,135	1	0,0766
Ingredients	198,872	2	<,0001*
Carbon footprint	293,287	9	<,0001*
Number of people	6,640	4	0,1562

*Figure 15: Likelihood Ratio test of veg*an ordinal analysis*

*Table 8: Veg*an ordinal analysis sans caloric value*

Source	LogWorth	PValue
Carbon footprint	57,950	0,00000
Ingredients	44,001	0,00000
Cleanliness	12,458	0,00000
Price	7,970	0,00000
Waiting time	7,702	0,00000
Company	1,122	0,07554
Number of people	0,788	0,16290

*Table 9: Veg*an ordinal analysis significants only*

Source	LogWorth	PValue
Carbon footprint	58,264	0,00000
Ingredients	54,527	0,00000
Cleanliness	12,594	0,00000
Waiting time	8,027	0,00000
Price	7,777	0,00000
Company	1,780	0,01659

*Table 10: Non-veg*an ordinal analysis by gender*

Source	LogWorth	PValue
Carbon footprint	67,744	0,00000
Cleanliness	57,599	0,00000
Waiting time	20,982	0,00000
Price	20,110	0,00000
Ingredients	6,275	0,00000
Gender*Cleanliness	2,866	0,00136
Gender*Ingredients	2,786	0,00164
Caloric value	1,476	0,03344
Gender*Company	1,217	0,06066
Company	0,676	0,21080
Number of people	0,562	0,27405
Gender*Waiting time	0,304	0,49671
Gender*Caloric value	0,258	0,55184
Gender*Price	0,232	0,58602
Gender*Number of people	0,092	0,80823
Gender*Carbon footprint	0,044	0,90265

*Table 11.1 Non-veg*an ordinal analysis by gender significants only*

Source	LogWorth	PValue
Carbon footprint	69,515	0,00000
Cleanliness	59,803	0,00000
Waiting time	22,318	0,00000
Price	20,564	0,00000
Ingredients	5,711	0,00000
Gender*Cleanliness	3,438	0,00036
Gender*Ingredients	2,998	0,00101
Caloric value	1,433	0,03691
Gender*Company	1,132	0,07384
Company	0,736	0,18352

Table 11.2

Source	LogWorth	PValue
Carbon footprint	69,340	0,00000
Cleanliness	59,628	0,00000
Waiting time	22,488	0,00000
Price	20,510	0,00000
Ingredients	7,416	0,00000
Cleanliness*Gender	3,415	0,00038
Ingredients*Gender	2,961	0,00109
Caloric value	1,438	0,03651
Company*Gender	1,066	0,08585

Table 11.3

Source	LogWorth	PValue
Carbon footprint	69,138	0,00000
Cleanliness	59,660	0,00000
Waiting time	22,489	0,00000
Price	20,541	0,00000
Ingredients	7,412	0,00000
Gender*Cleanliness	3,330	0,00047
Gender*Ingredients	2,430	0,00371
Caloric value	1,439	0,03639

Source	L-R ChiSquare	DF	Prob>ChiSq
Waiting time	111,643	4	<,0001*
Price	102,505	4	<,0001*
Cleanliness	274,747	2	<,0001*
Caloric value	6,627	2	0,0364*
Ingredients	34,133	2	<,0001*
Carbon footprint	349,670	9	<,0001*
Gender*Cleanliness	15,334	2	0,0005*
Gender*Ingredients	11,191	2	0,0037*

*Figure 16: Likelihood Ratio test for Non-veg*an ordinal analysis by gender significants only*

*Table 12 Veg*an ordinal analysis by gender*

Source	LogWorth	PValue
Carbon footprint	53,958	0,00000
Ingredients	39,227	0,00000
Cleanliness	7,150	0,00000
Price	6,442	0,00000
Waiting time	4,605	0,00002
Company	1,378	0,04184
Gender*Ingredients	0,982	0,10423
Number of people	0,845	0,14305
Gender*Company	0,642	0,22807
Gender*Number of people	0,587	0,25874
Gender*Caloric value	0,072	0,84698
Gender*Carbon footprint	0,006	0,98695
Caloric value	0,000	1,00000
Gender*Waiting time	0,000	1,00000
Gender*Price	0,000	1,00000
Gender*Cleanliness	0,000	1,00000

*Table 13: Veg*an ordinal analysis by gender significants only*

Source	LogWorth	PValue
Carbon footprint	58,836	0,00000
Ingredients	54,774	0,00000
Cleanliness	10,443	0,00000
Waiting time	8,001	0,00000
Price	7,794	0,00000
Gender*Cleanliness	2,069	0,00853
Company	1,801	0,01580

Source	L-R ChiSquare	DF	Prob>ChiSq
Waiting time	43,078	4	<,0001*
Price	42,078	4	<,0001*
Cleanliness	48,090	2	<,0001*
Ingredients	252,242	2	<,0001*
Carbon footprint	301,189	9	<,0001*
Company	5,825	1	0,0158*
Gender*Cleanliness	9,529	2	0,0085*

*Figure 17: Likelihood Ratio test for Veg*an ordinal analysis by gender significants only*

*Table 14: Non-veg*an ordinal analysis by age*

Source	LogWorth	PValue
Price	11,600	0,00000
Carbon footprint	11,454	0,00000
Cleanliness	7,880	0,00000
Waiting time	7,054	0,00000
Age*Price	5,304	0,00000
Ingredients	3,037	0,00092
Age*Waiting time	1,491	0,03229
Age*Ingredients	1,204	0,06248
Age*Carbon footprint	1,078	0,08360
Number of people	1,070	0,08515
Age*Cleanliness	0,851	0,14097
Age*Number of people	0,665	0,21642
Company	0,537	0,29051
Age*Caloric value	0,507	0,31082
Caloric value	0,367	0,42942
Age*Company	0,337	0,46050

*Table 15.1: Non-veg*an ordinal analysis by age significants only*

Source	LogWorth	PValue
Carbon footprint	76,134	0,00000
Price	10,274	0,00000
Waiting time	9,993	0,00000
Caloric value*Age	7,449	0,00000
Ingredients	5,333	0,00000
Price*Age	3,610	0,00025
Number of people	2,065	0,00861
Ingredients*Age	1,367	0,04293
Waiting time*Age	1,029	0,09344

Table 15.2

Source	LogWorth	PValue
Carbon footprint	76,274	0,00000
Waiting time	36,496	0,00000
Price	10,479	0,00000
Caloric value*Age	8,220	0,00000
Ingredients	5,418	0,00000
Price*Age	3,629	0,00023
Number of people	2,088	0,00816
Ingredients*Age	1,383	0,04138

Table 15.3

Source	LogWorth	PValue
Carbon footprint	70,890	0,00000
Cleanliness	64,400	0,00000
Price	10,421	0,00000
Waiting time	9,751	0,00000
Ingredients	4,511	0,00003
Age*Price	4,044	0,00009
Age*Waiting time	2,122	0,00756
Age*Ingredients	1,670	0,02138

Source	L-R ChiSquare	DF	Prob>ChiSq
Waiting time	51,477	4	<,0001*
Price	54,679	4	<,0001*
Cleanliness	296,575	2	<,0001*
Ingredients	20,774	2	<,0001*
Carbon footprint	357,902	9	<,0001*
Age*Waiting time	13,919	4	0,0076*
Age*Price	23,732	4	<,0001*
Age*Ingredients	7,691	2	0,0214*

*Figure 18: Likelihood Ratio test for Non-veg*an ordinal analysis by age significants only*

*Table 16: Veg*an ordinal analysis by age*

Source	LogWorth	PValue
Carbon footprint	10,785	0,00000
Number of people	5,013	0,00001
Price	4,110	0,00008
Age*Number of people	3,814	0,00015
Waiting time	3,567	0,00027
Age*Carbon footprint	2,645	0,00227
Ingredients	2,281	0,00524
Age*Ingredients	1,936	0,01159
Age*Waiting time	1,891	0,01287
Age*Company	1,779	0,01663
Age*Price	1,710	0,01950
Age*Cleanliness	1,423	0,03778
Company	0,511	0,30863
Age*Caloric value	0,038	0,91710
Cleanliness	0,000	1,00000
Caloric value	0,000	1,00000

*Table 17.1: Veg*an ordinal analysis by age significants only*

Source	LogWorth	PValue
Carbon footprint	10,870	0,00000
Number of people	5,224	0,00001
Number of people*Age	3,805	0,00016
Price	3,679	0,00021
Waiting time	3,634	0,00023
Company*Age	2,966	0,00108
Carbon footprint*Age	2,550	0,00282
Ingredients	2,036	0,00920
Waiting time*Age	1,725	0,01883
Ingredients*Age	1,657	0,02201
Price*Age	1,438	0,03646
Cleanliness*Age	1,320	0,04785
Cleanliness	1,099	0,07963
Caloric value*Age	0,867	0,13574

Table 17.2

Source	LogWorth	PValue
Ingredients	39,899	0,00000
Carbon footprint	10,876	0,00000
Price	8,803	0,00000
Waiting time	4,082	0,00008
Cleanliness	3,369	0,00043
Number of people	3,132	0,00074
Cleanliness*Age	2,131	0,00740
Number of people*Age	1,853	0,01402
Carbon footprint*Age	1,828	0,01486
Waiting time*Age	1,633	0,02328
Company*Age	1,270	0,05370

Table 17.3

Source	LogWorth	PValue
Ingredients	39,943	0,00000
Carbon footprint	10,723	0,00000
Price	8,989	0,00000
Waiting time	4,077	0,00008
Cleanliness	3,358	0,00044
Number of people	3,230	0,00059
Age*Cleanliness	2,053	0,00885
Age*Number of people	1,730	0,01862
Age*Carbon footprint	1,702	0,01988
Age*Waiting time	1,551	0,02814

Source	L-R ChiSquare	DF	Prob>ChiSq
Waiting time	23,899	4	<,0001*
Price	47,826	4	<,0001*
Cleanliness	15,465	2	0,0004*
Ingredients	183,943	2	<,0001*
Carbon footprint	69,520	9	<,0001*
Number of people	19,639	4	0,0006*
Age*Waiting time	10,864	4	0,0281*
Age*Cleanliness	9,455	2	0,0088*
Age*Carbon footprint	19,697	9	0,0199*
Age*Number of people	11,835	4	0,0186*

*Figure 19: Likelihood Ratio test for Veg*an ordinal analysis by age significants only*

*Table 18: Non-veg*an ordinal analysis by ethnicity*

Source	LogWorth	PValue
Waiting time	2,740	0,00182
Price	2,613	0,00244
Grouped Ethnicity*Ingredients	1,420	0,03801
Carbon footprint	0,812	0,15423
Grouped Ethnicity*Caloric value	0,207	0,62087
Grouped Ethnicity*Price	0,046	0,89989
Grouped Ethnicity*Number of people	0,025	0,94454
Grouped Ethnicity*Cleanliness	0,013	0,96972
Grouped Ethnicity*Carbon footprint	0,007	0,98437
Grouped Ethnicity*Waiting time	0,002	0,99428
Cleanliness	0,000	1,00000
Ingredients	0,000	1,00000
Caloric value	0,000	1,00000
Company	0,000	1,00000
Number of people	0,000	1,00000
Grouped Ethnicity*Company	0,000	1,00000

*Table 19.1: Non-veg*an ordinal analysis by ethnicity significants only*

Source	LogWorth	PValue
Price	2,576	0,00266
Waiting time	2,292	0,00511
Grouped Ethnicity*Ingredients	1,962	0,01092
Carbon footprint	1,931	0,01172
Company	0,541	0,28764
Grouped Ethnicity*Caloric value	0,209	0,61818
Number of people	0,091	0,81040
Grouped Ethnicity*Price	0,047	0,89647
Grouped Ethnicity*Number of people	0,042	0,90787
Grouped Ethnicity*Cleanliness	0,012	0,97265
Grouped Ethnicity*Carbon footprint	0,009	0,97968
Grouped Ethnicity*Waiting time	0,002	0,99454
Cleanliness	0,000	1,00000
Ingredients	0,000	1,00000
Caloric value	0,000	1,00000

Table 19.2

Source	LogWorth	PValue
Waiting time	2,645	0,00227
Price	2,537	0,00291
Ingredients*Grouped Ethnicity	1,944	0,01137
Caloric value*Grouped Ethnicity	1,114	0,07683
Carbon footprint	0,691	0,20394
Company	0,538	0,28941
Number of people	0,075	0,84044
Price*Grouped Ethnicity	0,051	0,88926
Number of people*Grouped Ethnicity	0,036	0,92123
Cleanliness*Grouped Ethnicity	0,017	0,96269
Carbon footprint*Grouped Ethnicity	0,008	0,98078
Waiting time*Grouped Ethnicity	0,002	0,99516
Cleanliness	0,000	1,00000
Ingredients	0,000	1,00000

Table 19.3

Source	LogWorth	PValue
Carbon footprint	12,060	0,00000
Ingredients*Grouped Ethnicity	7,338	0,00000
Waiting time	2,437	0,00366
Price	2,264	0,00545
Caloric value*Grouped Ethnicity	1,150	0,07086
Company	0,526	0,29759
Cleanliness*Grouped Ethnicity	0,305	0,49502
Cleanliness	0,118	0,76200
Carbon footprint*Grouped Ethnicity	0,064	0,86381
Number of people*Grouped Ethnicity	0,051	0,88930
Number of people	0,046	0,89881
Price*Grouped Ethnicity	0,027	0,94037
Waiting time*Grouped Ethnicity	0,014	0,96832

Table 19.4

Source	LogWorth	PValue
Waiting time	22,756	0,00000
Carbon footprint	17,367	0,00000
Cleanliness	10,722	0,00000
Ingredients*Grouped Ethnicity	7,319	0,00000
Price	3,080	0,00083
Cleanliness*Grouped Ethnicity	1,994	0,01014
Carbon footprint*Grouped Ethnicity	1,162	0,06883
Caloric value*Grouped Ethnicity	1,157	0,06961
Number of people*Grouped Ethnicity	0,647	0,22555
Company	0,528	0,29639
Price*Grouped Ethnicity	0,503	0,31404

Table 19.5

Source	LogWorth	PValue
Carbon footprint	70,973	0,00000
Cleanliness	65,207	0,00000
Waiting time	23,571	0,00000
Price	20,270	0,00000
Ingredients*Grouped Ethnicity	6,267	0,00000

Source	L-R ChiSquare	DF	Prob>ChiSq
Waiting time	116,715	4	<,0001*
Price	101,233	4	<,0001*
Cleanliness	300,289	2	<,0001*
Carbon footprint	358,290	9	<,0001*
Ingredients*Grouped Ethnicity	44,115	8	<,0001*

*Figure 20: Likelihood Ratio test for non-veg*an ordinal analysis by grouped ethnicity significants only*

*Table 20: Veg*an ordinal analysis by ethnicity*

Source	LogWorth	PValue
Carbon footprint	10,250	0,00000
Ingredients	5,802	0,00000
Price	2,486	0,00327
Waiting time	1,433	0,03690
Grouped Ethnicity*Cleanliness	0,756	0,17527
Number of people	0,068	0,85517
Grouped Ethnicity*Caloric value	0,004	0,99138
Grouped Ethnicity*Number of people	0,001	0,99665
Grouped Ethnicity*Waiting time	0,001	0,99884
Cleanliness	0,000	1,00000
Caloric value	0,000	1,00000
Company	0,000	1,00000
Grouped Ethnicity*Price	0,000	1,00000
Grouped Ethnicity*Ingredients	0,000	1,00000
Grouped Ethnicity*Carbon footprint	0,000	1,00000
Grouped Ethnicity*Company	0,000	1,00000

*Table 21.2: Veg*an ordinal analysis by ethnicity significants only*

Source	LogWorth	PValue
Carbon footprint	62,177	0,00000
Ingredients	18,165	0,00000
Grouped Ethnicity*Cleanliness	5,512	0,00000
Waiting time	4,623	0,00002
Cleanliness	4,477	0,00003
Price	4,189	0,00006
Company	1,603	0,02496
Grouped Ethnicity*Waiting time	1,520	0,03023
Grouped Ethnicity*Caloric value	1,196	0,06367
Grouped Ethnicity*Number of people	0,572	0,26762
Grouped Ethnicity*Ingredients	0,265	0,54266
Number of people	0,189	0,64737
Grouped Ethnicity*Price	0,122	0,75531
Caloric value	0,000	1,00000

Table 21.2

Source	LogWorth	PValue
Carbon footprint	63,767	0,00000
Ingredients	45,849	0,00000
Price	8,130	0,00000
Cleanliness*Grouped Ethnicity	7,064	0,00000
Cleanliness	6,799	0,00000
Waiting time	4,910	0,00001
Waiting time*Grouped Ethnicity	2,119	0,00760
Company	1,557	0,02775
Caloric value*Grouped Ethnicity	1,502	0,03149
Number of people*Grouped Ethnicity	0,663	0,21743
Company*Grouped Ethnicity	0,410	0,38884
Number of people	0,170	0,67645

Table 21.3

Source	LogWorth	PValue
Carbon footprint	63,886	0,00000
Ingredients	51,914	0,00000
Price	7,925	0,00000
Cleanliness*Grouped Ethnicity	6,570	0,00000
Cleanliness	6,533	0,00000
Waiting time	5,169	0,00001
Waiting time*Grouped Ethnicity	1,851	0,01410
Company	1,577	0,02651
Caloric value*Grouped Ethnicity	1,231	0,05871
Number of people*Grouped Ethnicity	1,146	0,07143

Table 21.4

Source	LogWorth	PValue
Carbon footprint	62,524	0,00000
Ingredients	57,261	0,00000
Price	7,577	0,00000
Cleanliness	6,537	0,00000
Cleanliness*Grouped Ethnicity	6,037	0,00000
Waiting time	5,492	0,00000
Company	2,152	0,00705
Waiting time*Grouped Ethnicity	1,409	0,03900
Caloric value*Grouped Ethnicity	1,153	0,07035

Table 21.5

Source	LogWorth	PValue
Carbon footprint	59,538	0,00000
Ingredients	54,870	0,00000
Waiting time	8,064	0,00000
Price	7,754	0,00000
Cleanliness	5,854	0,00000
Grouped Ethnicity*Cleanliness	3,558	0,00028
Company	1,810	0,01547

Source	L-R ChiSquare	DF	Prob>ChiSq
Waiting time	43,380	4	<,0001*
Price	41,886	4	<,0001*
Cleanliness	26,960	2	<,0001*
Ingredients	252,688	2	<,0001*
Carbon footprint	304,500	9	<,0001*
Company	5,862	1	0,0155*
Grouped Ethnicity*Cleanliness	25,492	6	0,0003*

*Figure 21: Likelihood Ratio test for Veg*an ordinal analysis by grouped ethnicity significants only*

*Table 22 Non-veg*an ordinal analysis by education*

Source	LogWorth	PValue
Education*Carbon footprint	3,212	0,00061
Education*Waiting time	1,635	0,02316
Education*Price	1,278	0,05269
Carbon footprint	1,122	0,07546
Education*Number of people	0,925	0,11889
Number of people	0,547	0,28395
Price	0,364	0,43263
Education*Company	0,337	0,45973
Education*Cleanliness	0,336	0,46118
Cleanliness	0,250	0,56235
Ingredients	0,213	0,61237
Company	0,111	0,77372
Waiting time	0,064	0,86235
Education*Ingredients	0,028	0,93757
Caloric value	0,027	0,93953
Education*Caloric value	0,012	0,97245

*Table 23.1: Non-veg*an ordinal analysis by education significants only*

Source	LogWorth	PValue
Ingredients	13,380	0,00000
Education*Carbon footprint	4,050	0,00009
Caloric value	3,102	0,00079
Carbon footprint	2,129	0,00742

Table 23.2

Source	LogWorth	PValue
Ingredients	7,220	0,00000
Carbon footprint*Education	3,819	0,00015
Waiting time*Education	2,620	0,00240
Caloric value	1,616	0,02421
Price*Education	1,415	0,03844
Cleanliness*Education	1,211	0,06158
Carbon footprint	1,166	0,06826
Number of people*Education	1,046	0,09002
Number of people	0,553	0,28021
Company*Education	0,463	0,34418
Price	0,358	0,43807
Cleanliness	0,217	0,60640
Waiting time	0,079	0,83297

Table 23.3

Source	LogWorth	PValue
Cleanliness*Education	55,126	0,00000
Waiting time*Education	23,085	0,00000
Price*Education	19,740	0,00000
Ingredients	9,351	0,00000
Carbon footprint*Education	3,602	0,00025
Caloric value	1,575	0,02662
Carbon footprint	1,416	0,03840
Number of people*Education	1,046	0,08993
Number of people	0,570	0,26923

Table 23.4

Source	LogWorth	PValue
Cleanliness*Education	56,906	0,00000
Waiting time*Education	22,877	0,00000
Price*Education	19,159	0,00000
Ingredients	8,372	0,00000
Carbon footprint*Education	4,101	0,00008
Carbon footprint	2,057	0,00877
Caloric value	1,590	0,02569

Source	L-R ChiSquare	DF	Prob>ChiSq
Caloric value	7,323	2	0,0257*
Ingredients	38,556	2	<,0001*
Carbon footprint	22,033	9	0,0088*
Carbon footprint*Education	63,909	27	<,0001*
Price*Education	119,751	12	<,0001*
Waiting time*Education	138,287	12	<,0001*
Cleanliness*Education	280,478	6	<,0001*

*Figure 22: Likelihood Ratio test for Non-veg*an ordinal analysis by education significants only*

*Table 24: Veg*an ordinal analysis by education*

Source	LogWorth	PValue
Ingredients	2,464	0,00344
Carbon footprint	0,604	0,24888
Cleanliness	0,444	0,35963
Education*Cleanliness	0,191	0,64411
Education*Waiting time	0,171	0,67470
Price	0,048	0,89580
Education*Number of people	0,000	0,99911
Waiting time	0,000	1,00000
Company	0,000	1,00000
Caloric value	0,000	1,00000
Number of people	0,000	1,00000
Education*Price	0,000	1,00000
Education*Ingredients	0,000	1,00000
Education*Carbon footprint	0,000	1,00000
Education*Company	0,000	1,00000
Education*Caloric value	0,000	1,00000

*Table 25.1: Veg*an ordinal analysis by education significants only*

Source	LogWorth	PValue
Ingredients	30,938	0,00000
Education*Cleanliness	1,681	0,02082
Company	0,848	0,14194
Carbon footprint	0,725	0,18849
Education*Waiting time	0,534	0,29264
Cleanliness	0,522	0,30069
Caloric value	0,137	0,72996
Education*Number of people	0,099	0,79615
Education*Carbon footprint	0,089	0,81522
Price	0,062	0,86630
Education*Price	0,000	0,99938
Waiting time	0,000	1,00000
Number of people	0,000	1,00000

Table 25.2

Source	LogWorth	PValue
Ingredients	38,673	0,00000
Price	7,608	0,00000
Waiting time*Education	6,436	0,00000
Carbon footprint	2,189	0,00647
Cleanliness*Education	1,929	0,01177
Number of people*Education	0,994	0,10140
Company	0,679	0,20951
Carbon footprint*Education	0,545	0,28519
Cleanliness	0,496	0,31949
Caloric value	0,000	1,00000

Table 25.3

Source	LogWorth	PValue
Carbon footprint	59,409	0,00000
Ingredients	45,842	0,00000
Cleanliness*Education	11,220	0,00000
Price	8,130	0,00000
Waiting time*Education	6,343	0,00000
Company	1,213	0,06126
Number of people*Education	0,430	0,37166

Table 25.4

Source	LogWorth	PValue
Carbon footprint	59,489	0,00000
Ingredients	54,860	0,00000
Cleanliness*Education	11,272	0,00000
Price	8,011	0,00000
Waiting time*Education	6,887	0,00000
Company	1,867	0,01359

Source	L-R ChiSquare	DF	Prob>ChiSq
Price	43,127	4	<,0001*
Company	6,090	1	0,0136*
Ingredients	252,638	2	<,0001*
Carbon footprint	304,270	9	<,0001*
Waiting time*Education	55,804	12	<,0001*
Cleanliness*Education	64,544	6	<,0001*

*Figure 23: Likelihood Ratio test for Veg*an ordinal analysis by education significants only*

*Table 26 Non-veg*an ordinal analysis by work experience*

Source	LogWorth	PValue
Carbon footprint	3,826	0,00015
Price	1,510	0,03093
Cleanliness	1,267	0,05409
Work experience*Company	0,961	0,10941
Work experience*Ingredients	0,893	0,12782
Caloric value	0,619	0,24036
Company	0,561	0,27457
Waiting time	0,485	0,32715
Work experience*Price	0,436	0,36642
Work experience*Waiting time	0,348	0,44855
Work experience*Cleanliness	0,194	0,63978
Work experience*Number of people	0,114	0,76915
Work experience*Carbon footprint	0,099	0,79580
Work experience*Caloric value	0,035	0,92349
Ingredients	0,000	1,00000
Number of people	0,000	1,00000

*Table 27: Non-veg*an ordinal analysis by work experience significants only*

Source	LogWorth	PValue
Carbon footprint	70,402	0,00000
Cleanliness	58,739	0,00000
Waiting time	22,332	0,00000
Price	20,436	0,00000
Ingredients*Work experience	4,718	0,00002
Company*Work experience	1,623	0,02381
Caloric value	1,514	0,03059
Company	1,439	0,03641

Source	L-R ChiSquare	DF	Prob>ChiSq
Waiting time	110,908	4	<,0001*
Price	102,016	4	<,0001*
Cleanliness	270,505	2	<,0001*
Caloric value	6,974	2	0,0306*
Company	4,378	1	0,0364*
Carbon footprint	355,608	9	<,0001*
Ingredients*Work experience	53,883	18	<,0001*
Company*Work experience	19,166	9	0,0238*

*Figure 24: Likelihood Ratio test for Non-veg*an ordinal analysis by work experience significants only*

*Table 28: Veg*an ordinal analysis by work experience*

Source	LogWorth	PValue
Ingredients	1,836	0,01458
Price	0,855	0,13955
Waiting time	0,855	0,13955
Caloric value	0,491	0,32278
Carbon footprint	0,191	0,64425
Number of people	0,125	0,74910
Work experience*Number of people	0,001	0,99758
Work experience*Ingredients	0,000	0,99893
Work experience*Waiting time	0,000	1,00000
Cleanliness	0,000	1,00000
Work experience*Price	0,000	1,00000
Work experience*Carbon footprint	0,000	1,00000
Company	0,000	1,00000
Work experience*Cleanliness	0,000	1,00000
Work experience*Company	0,000	1,00000
Work experience*Caloric value	.	.

*Table 29.1: Veg*an ordinal analysis by work experience significants only*

Source	LogWorth	PValue
Ingredients	1,836	0,01458
Price	0,855	0,13955
Waiting time	0,855	0,13955
Number of people	0,125	0,74910
Caloric value	0,043	0,90664
Work experience*Ingredients	0,004	0,99162
Work experience*Waiting time	0,000	1,00000
Cleanliness	0,000	1,00000
Company	0,000	1,00000
Work experience*Cleanliness	0,000	1,00000
Work experience*Number of people	.	.
Work experience*Carbon footprint	.	.
Work experience*Price	.	.
Carbon footprint	.	.

Table 29.2

Source	LogWorth	PValue
Ingredients*Work experience	38,889	0,00000
Waiting time*Work experience	4,539	0,00003
Price*Work experience	3,901	0,00013

Table 29.3

Source	LogWorth	PValue
Ingredients	13,763	0,00000
Waiting time	7,599	0,00000
Cleanliness	5,672	0,00000
Price	5,515	0,00000
Work experience*Ingredients	3,290	0,00051
Work experience*Number of people	1,955	0,01109
Number of people	1,950	0,01121
Work experience*Price	1,775	0,01677
Work experience*Cleanliness	1,762	0,01729

Source	L-R ChiSquare	DF	Prob>ChiSq
Waiting time	41,139	4	<,0001*
Price	31,004	4	<,0001*
Cleanliness	26,121	2	<,0001*
Ingredients	63,381	2	<,0001*
Number of people	13,014	4	0,0112*
Work experience*Price	51,265	32	0,0168*
Work experience*Cleanliness	30,140	16	0,0173*
Work experience*Ingredients	41,233	16	0,0005*
Work experience*Number of people	53,048	32	0,0111*

*Figure 25: Likelihood Ratio test for Veg*an ordinal analysis by work experience significants only*

*Table 30: Non-veg*an ordinal analysis by income*

Source	LogWorth	PValue
Carbon footprint	18,782	0,00000
Cleanliness	13,878	0,00000
Price	7,531	0,00000
Waiting time	6,769	0,00000
Income*Ingredients	2,228	0,00592
Ingredients	2,176	0,00667
Number of people	0,950	0,11220
Company	0,333	0,46463
Income*Cleanliness	0,190	0,64619
Income*Price	0,166	0,68197
Caloric value	0,086	0,81946
Income*Waiting time	0,059	0,87248
Income*Number of people	0,059	0,87367
Income*Carbon footprint	0,000	0,99998
Income*Caloric value	0,000	1,00000
Income*Company	0,000	1,00000

*Table 31: Non-veg*an ordinal analysis by income significants only*

Source	LogWorth	PValue
Carbon footprint	68,735	0,00000
Waiting time	22,962	0,00000
Price	20,585	0,00000
Cleanliness	16,607	0,00000
Income*Ingredients	5,553	0,00000
Ingredients	2,672	0,00213
Income*Cleanliness	1,541	0,02875
Caloric value	1,524	0,02990

Source	L-R ChiSquare	DF	Prob>ChiSq
Waiting time	113,862	4	<,0001*
Price	102,715	4	<,0001*
Cleanliness	76,478	2	<,0001*
Caloric value	7,020	2	0,0299*
Ingredients	12,307	2	0,0021*
Carbon footprint	347,777	9	<,0001*
Cleanliness*Income	22,882	12	0,0287*
Ingredients*Income	48,274	12	<,0001*

*Figure 26: Likelihood Ratio test for Non-veg*an ordinal analysis by income significants only*

*Table 32: Veg*an ordinal analysis by income*

Source	LogWorth	PValue
Carbon footprint	23,162	0,00000
Ingredients	14,513	0,00000
Price	4,900	0,00001
Waiting time	1,610	0,02453
Company	0,794	0,16078
Income*Cleanliness	0,127	0,74670
Income*Price	0,045	0,90073
Income*Waiting time	0,001	0,99879
Number of people	0,000	0,99920
Income*Caloric value	0,000	0,99999
Cleanliness	0,000	1,00000
Caloric value	0,000	1,00000
Income*Company	0,000	1,00000
Income*Ingredients	0,000	1,00000
Income*Carbon footprint	0,000	1,00000
Income*Number of people	0,000	1,00000

*Table 33: Veg*an ordinal analysis by income significants only*

Source	LogWorth	PValue
Carbon footprint	58,943	0,00000
Ingredients	55,134	0,00000
Cleanliness	11,630	0,00000
Waiting time	7,940	0,00000
Price	7,801	0,00000
Company	1,833	0,01468
Income*Cleanliness	1,498	0,03180

Source	L-R ChiSquare	DF	Prob>ChiSq
Waiting time	42,781	4	<,0001*
Price	42,112	4	<,0001*
Cleanliness	53,560	2	<,0001*
Company	5,954	1	0,0147*
Ingredients	253,901	2	<,0001*
Carbon footprint	301,696	9	<,0001*
Cleanliness*Income	13,813	6	0,0318*

*Figure 27: Likelihood Ratio test for Veg*an ordinal analysis by income significants only*

*Table 34: Non-veg*an ordinal analysis by fast-food frequency*

Source	LogWorth	PValue
Fast food Frequency*Caloric value	1,357	0,04393
Fast food Frequency*Price	1,238	0,05777
Fast food Frequency*Carbon footprint	0,513	0,30698
Caloric value	0,445	0,35866
Fast food Frequency*Ingredients	0,354	0,44282
Price	0,230	0,58831
Carbon footprint	0,132	0,73717
Fast food Frequency*Waiting time	0,033	0,92727
Ingredients	0,021	0,95238
Waiting time	0,014	0,96807
Fast food Frequency*Number of people	0,001	0,99698
Cleanliness	0,000	1,00000
Company	0,000	1,00000
Number of people	0,000	1,00000
Fast food Frequency*Cleanliness	0,000	1,00000
Fast food Frequency*Company	0,000	1,00000

*Table 35.1: Non-veg*an ordinal analysis by fast-food frequency significants only*

Source	LogWorth	PValue
Cleanliness	60,682	0,00000
Waiting time*Fast food Frequency	16,761	0,00000
Ingredients*Fast food Frequency	4,814	0,00002
Carbon footprint*Fast food Frequency	2,242	0,00572
Price*Fast food Frequency	2,067	0,00857
Caloric value*Fast food Frequency	1,798	0,01592
Price	1,462	0,03448
Caloric value	1,369	0,04274
Carbon footprint	1,286	0,05173
Company	0,614	0,24298

Table 35.2

Source	LogWorth	PValue
Carbon footprint*Fast food Frequency	62,144	0,00000
Cleanliness	59,563	0,00000
Waiting time*Fast food Frequency	17,031	0,00000
Ingredients*Fast food Frequency	6,382	0,00000
Caloric value*Fast food Frequency	1,812	0,01543
Price*Fast food Frequency	1,671	0,02132
Caloric value	1,270	0,05367
Price	0,823	0,15024

Table 35.3

Source	LogWorth	PValue
Carbon footprint*Fast food Frequency	62,095	0,00000
Cleanliness	58,904	0,00000
Price*Fast food Frequency	18,037	0,00000
Waiting time*Fast food Frequency	17,229	0,00000
Ingredients*Fast food Frequency	6,424	0,00000
Caloric value*Fast food Frequency	2,163	0,00688

Source	L-R ChiSquare	DF	Prob>ChiSq
Waiting time*Fast food Frequency	119,835	16	<,0001*
Price*Fast food Frequency	124,034	16	<,0001*
Caloric value*Fast food Frequency	21,104	8	0,0069*
Ingredients*Fast food Frequency	44,946	8	<,0001*
Carbon footprint*Fast food Frequency	399,203	36	<,0001*
Cleanliness	271,262	2	<,0001*

*Figure 28: Likelihood Ratio test for Non-veg*an ordinal analysis by fast-food frequency significants only*

*Table 36: Veg*an ordinal analysis by fast-food frequency*

Source	LogWorth	PValue
Cleanliness	0,574	0,26681
Ingredients	0,560	0,27525
Fast food Frequency*Price	0,343	0,45425
Fast food Frequency*Cleanliness	0,143	0,71973
Fast food Frequency*Waiting time	0,117	0,76312
Price	0,105	0,78485
Fast food Frequency*Company	0,059	0,87357
Waiting time	0,004	0,99052
Carbon footprint	0,000	0,99959
Caloric value	0,000	1,00000
Company	0,000	1,00000
Number of people	0,000	1,00000
Fast food Frequency*Caloric value	0,000	1,00000
Fast food Frequency*Ingredients	0,000	1,00000
Fast food Frequency*Carbon footprint	0,000	1,00000
Fast food Frequency*Number of people	0,000	1,00000

*Table 37.1: Veg*an ordinal analysis by fast-food frequency significants only*

Source	LogWorth	PValue
Carbon footprint	60,736	0,00000
Fast food Frequency*Waiting time	1,355	0,04420
Number of people	0,922	0,11974
Fast food Frequency*Price	0,889	0,12926
Ingredients	0,634	0,23203
Fast food Frequency*Cleanliness	0,432	0,37001
Cleanliness	0,424	0,37644
Waiting time	0,181	0,65918
Fast food Frequency*Ingredients	0,039	0,91476
Fast food Frequency*Caloric value	0,009	0,97903
Fast food Frequency*Company	0,006	0,98709
Price	0,000	1,00000
Caloric value	0,000	1,00000
Company	0,000	1,00000

Table 37.2

Source	LogWorth	PValue
Carbon footprint	61,509	0,00000
Ingredients	46,268	0,00000
Cleanliness	1,973	0,01064
Price*Fast food Frequency	1,780	0,01659
Price	1,348	0,04488
Waiting time*Fast food Frequency	1,029	0,09348
Number of people	0,965	0,10851
Company*Fast food Frequency	0,729	0,18655
Cleanliness*Fast food Frequency	0,536	0,29086
Waiting time	0,159	0,69355

Table 37.3

Source	LogWorth	PValue
Carbon footprint	59,995	0,00000
Ingredients	45,895	0,00000
Cleanliness	12,940	0,00000
Waiting time*Fast food Frequency	7,774	0,00000
Price*Fast food Frequency	1,701	0,01989
Number of people	1,673	0,02126
Price	1,236	0,05812

Table 37.4

Source	LogWorth	PValue
Carbon footprint	59,330	0,00000
Ingredients	46,659	0,00000
Cleanliness	12,869	0,00000
Waiting time*Fast food Frequency	7,764	0,00000
Price*Fast food Frequency	7,537	0,00000
Number of people	1,499	0,03170

Source	L-R ChiSquare	DF	Prob>ChiSq
Cleanliness	59,262	2	<,0001*
Ingredients	214,871	2	<,0001*
Carbon footprint	303,522	9	<,0001*
Waiting time*Fast food Frequency	60,646	12	<,0001*
Price*Fast food Frequency	59,398	12	<,0001*
Number of people	10,581	4	0,0317*

*Figure 29: Likelihood Ratio test for Veg*an ordinal analysis by fast-food frequency significants only*

*Table 38: Non-veg*an ordinal analysis by vegan frequency*

Source	LogWorth	PValue
Cleanliness	23,570	0,00000
Carbon footprint	15,813	0,00000
Ingredients	12,976	0,00000
Price	8,766	0,00000
Waiting time	6,854	0,00000
Vegan Frequency*Carbon footprint	1,584	0,02603
Caloric value	0,984	0,10370
Vegan Frequency*Number of people	0,810	0,15502
Vegan Frequency*Ingredients	0,634	0,23240
Vegan Frequency*Price	0,531	0,29415
Company	0,177	0,66510
Number of people	0,160	0,69190
Vegan Frequency*Waiting time	0,012	0,97193
Vegan Frequency*Caloric value	0,009	0,97929
Vegan Frequency*Cleanliness	0,005	0,98902
Vegan Frequency*Company	0,001	0,99846

*Table 39.1: Non-veg*an ordinal analysis by vegan frequency significants only*

Source	LogWorth	PValue
Waiting time	6,883	0,00000
Vegan Frequency*Ingredients	4,167	0,00007
Vegan Frequency*Carbon footprint	1,734	0,01844
Vegan Frequency*Number of people	1,164	0,06852
Caloric value	0,985	0,10348
Vegan Frequency*Price	0,752	0,17717
Vegan Frequency*Cleanliness	0,244	0,57020
Number of people	0,163	0,68699
Vegan Frequency*Waiting time	0,109	0,77884
Vegan Frequency*Caloric value	0,095	0,80322
Carbon footprint	.	.
Ingredients	.	.
Company	.	.
Cleanliness	.	.
Price	.	.

Table 39.2

Source	LogWorth	PValue
Price*Vegan Frequency	8,901	0,00000
Ingredients*Vegan Frequency	4,415	0,00004
Carbon footprint*Vegan Frequency	1,610	0,02456
Number of people*Vegan Frequency	1,149	0,07096
Caloric value	0,814	0,15355
Cleanliness*Vegan Frequency	0,336	0,46173
Number of people	0,145	0,71536
Caloric value*Vegan Frequency	0,091	0,81097
Waiting time*Vegan Frequency	0,076	0,83928
Cleanliness	.	.
Carbon footprint	.	.
Ingredients	.	.
Company	.	.
Waiting time	.	.

Table 39.3

Source	LogWorth	PValue
Carbon footprint*Vegan Frequency	47,013	0,00000
Waiting time*Vegan Frequency	18,569	0,00000
Price*Vegan Frequency	10,415	0,00000
Number of people*Vegan Frequency	3,341	0,00046
Number of people	2,554	0,00279
Ingredients*Vegan Frequency	1,567	0,02708
Caloric value*Vegan Frequency	1,205	0,06237
Caloric value	1,107	0,07813

Table 39.4

Source	LogWorth	PValue
Carbon footprint*Vegan Frequency	47,013	0,00000
Waiting time*Vegan Frequency	18,569	0,00000
Price*Vegan Frequency	10,415	0,00000
Number of people*Vegan Frequency	3,341	0,00046
Caloric value*Vegan Frequency	2,575	0,00266
Number of people	2,554	0,00279
Ingredients*Vegan Frequency	1,567	0,02708

Source	L-R ChiSquare	DF	Prob>ChiSq
Waiting time*Vegan Frequency	145,081	24	<,0001*
Price*Vegan Frequency	99,368	24	<,0001*
Caloric value*Vegan Frequency	30,142	12	0,0027*
Ingredients*Vegan Frequency	23,077	12	0,0271*
Carbon footprint*Vegan Frequency	365,040	54	<,0001*
Number of people*Vegan Frequency	53,778	24	0,0005*
Number of people	16,178	4	0,0028*

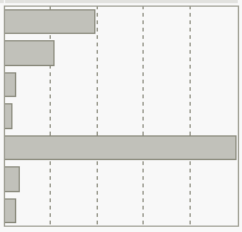


*Figure 30: Likelihood Ratio test for Non-veg*an ordinal analysis by vegan frequency significants only*

*Table 40: Veg*an ordinal analysis by vegan frequency*

Source	LogWorth	PValue
Price	0,072	0,84657
Waiting time	0,072	0,84657
Number of people	0,072	0,84657
Vegan Frequency*Caloric value	0,022	0,94957
Vegan Frequency*Waiting time	0,009	0,98017
Vegan Frequency*Number of people	0,004	0,99179
Carbon footprint	0,001	0,99791
Vegan Frequency*Price	0,000	0,99999
Company	0,000	1,00000
Ingredients	0,000	1,00000
Caloric value	0,000	1,00000
Cleanliness	0,000	1,00000
Vegan Frequency*Cleanliness	0,000	1,00000
Vegan Frequency*Company	0,000	1,00000
Vegan Frequency*Ingredients	0,000	1,00000
Vegan Frequency*Carbon footprint	.	.

*Table 41.1: Veg*an ordinal analysis by vegan frequency significants only*

Source	LogWorth	PValue
Vegan Frequency*Company	1,132	0,07380
Vegan Frequency*Number of people	0,418	0,38155
Vegan Frequency*Waiting time	0,107	0,78115
Vegan Frequency*Caloric value	0,101	0,79302
Price	0,073	0,84575
Waiting time	0,072	0,84656
Number of people	0,072	0,84657
Ingredients	0,002	0,99460
Company	0,000	0,99954
Cleanliness	0,000	0,99972
Caloric value	0,000	1,00000
Vegan Frequency*Ingredients	.	.
Vegan Frequency*Cleanliness	.	.
Vegan Frequency*Price	.	.
Carbon footprint	.	.

Table 41.2

Source	LogWorth	PValue
Vegan Frequency*Company	1,497	0,03183
Vegan Frequency*Number of people	1,148	0,07115
Vegan Frequency*Waiting time	0,558	0,27692
Number of people	0,421	0,37966
Vegan Frequency*Price	0,324	0,47370
Price	0,098	0,79713
Vegan Frequency*Caloric value	0,055	0,88087
Company	0,001	0,99771
Caloric value	0,000	1,00000
Vegan Frequency*Ingredients	.	.
Vegan Frequency*Cleanliness	.	.
Ingredients	.	.
Cleanliness	.	.
Waiting time	.	.

Table 41.3

Source	LogWorth	PValue
Waiting time*Vegan Frequency	6,821	0,00000
Cleanliness*Vegan Frequency	4,756	0,00002
Price	1,971	0,01070
Company*Vegan Frequency	1,497	0,03183
Number of people*Vegan Frequency	1,426	0,03748
Price*Vegan Frequency	1,129	0,07425
Caloric value*Vegan Frequency	0,870	0,13505
Number of people	0,855	0,13955
Company	0,003	0,99418
Cleanliness	.	.
Ingredients	.	.
Ingredients*Vegan Frequency	.	.
Caloric value	.	.

Table 41.4

Source	LogWorth	PValue
Price*Vegan Frequency	8,289	0,00000
Ingredients*Vegan Frequency	6,509	0,00000
Waiting time*Vegan Frequency	5,787	0,00000
Cleanliness	1,806	0,01563
Ingredients	1,707	0,01962
Cleanliness*Vegan Frequency	1,641	0,02284
Number of people	1,228	0,05911
Caloric value*Vegan Frequency	0,891	0,12847
Company*Vegan Frequency	0,026	0,94283
Company	0,018	0,95988

Table 41.5

Source	LogWorth	PValue
Price*Vegan Frequency	9,048	0,00000
Ingredients*Vegan Frequency	7,365	0,00000
Waiting time*Vegan Frequency	5,365	0,00000
Cleanliness	1,806	0,01563
Ingredients	1,806	0,01563
Cleanliness*Vegan Frequency	1,444	0,03594

Source	L-R ChiSquare	DF	Prob>ChiSq
Cleanliness	8,318	2	0,0156*
Ingredients	8,318	2	0,0156*
Waiting time*Vegan Frequency	61,402	20	<,0001*
Price*Vegan Frequency	83,758	20	<,0001*
Cleanliness*Vegan Frequency	19,359	10	0,0359*
Ingredients*Vegan Frequency	54,271	10	<,0001*

*Figure 31: Likelihood Ratio test for Veg*an ordinal analysis by vegan frequency significants only*

*Table 42.1: Non-veg*an ordinal analysis all variables except vegan frequency*

Source	LogWorth	PValue
Ingredients*Income	6,172	0,00000
Cleanliness*Gender	3,429	0,00037
Ingredients*Grouped Ethnicity	3,204	0,00063
Carbon footprint*Education	2,039	0,00913
Cleanliness*Income	1,881	0,01316
Ingredients*Work experience	1,794	0,01607
Waiting time*Age	1,548	0,02834
Waiting time*Education	1,456	0,03498
Caloric value*Fast food Frequency	1,436	0,03660
Company*Work experience	1,338	0,04588
Cleanliness*Education	1,182	0,06575
Price*Age	0,921	0,12006
Ingredients*Age	0,644	0,22723
Ingredients*Gender	0,597	0,25302
Company	0,580	0,26281
Carbon footprint	0,574	0,26668
Number of people	0,495	0,31959
Carbon footprint*Fast food Frequency	0,462	0,34554
Caloric value	0,394	0,40389
Cleanliness	0,382	0,41508
Price*Education	0,217	0,60638
Price*Fast food Frequency	0,087	0,81798
Waiting time*Fast food Frequency	0,000	0,99892
Ingredients*Fast food Frequency	0,000	1,00000
Waiting time	0,000	1,00000
Price	0,000	1,00000
Ingredients	0,000	1,00000

Table 42.2

Source	LogWorth	PValue
Cleanliness*Education	18,260	0,00000
Waiting time*Education	11,160	0,00000
Ingredients*Income	8,732	0,00000
Price*Fast food Frequency	8,272	0,00000
Ingredients*Grouped Ethnicity	3,911	0,00012
Cleanliness*Gender	3,096	0,00080
Carbon footprint*Education	2,695	0,00202
Cleanliness*Income	2,491	0,00323
Carbon footprint*Fast food Frequency	2,459	0,00347
Price*Age	2,352	0,00444
Caloric value*Fast food Frequency	1,911	0,01227
Waiting time*Age	1,593	0,02555
Company*Work experience	1,478	0,03323
Ingredients*Work experience	1,465	0,03428

Source	L-R ChiSquare	DF	Prob>ChiSq
Cleanliness*Education	98,366	6	<,0001*
Waiting time*Education	78,821	12	<,0001*
Carbon footprint*Education	52,989	27	0,0020*
Ingredients*Income	65,907	12	<,0001*
Price*Fast food Frequency	71,542	16	<,0001*
Ingredients*Grouped Ethnicity	31,330	8	0,0001*
Cleanliness*Gender	14,258	2	0,0008*
Cleanliness*Income	29,578	12	0,0032*
Carbon footprint*Fast food Frequency	63,082	36	0,0035*
Price*Age	15,128	4	0,0044*
Caloric value*Fast food Frequency	19,529	8	0,0123*
Waiting time*Age	11,092	4	0,0256*
Company*Work experience	18,172	9	0,0332*
Ingredients*Work experience	30,339	18	0,0343*

*Figure 32: Likelihood Ratio test for Non-veg*an ordinal analysis all variables except vegan frequency*

*Table 43.1 Non-veg*an ordinal analysis all variables Firth-Bias adjusted estimate turned off*

Source	LogWorth	PValue
Ingredients*Vegan Frequency	7,731	0,00000
Ingredients*Grouped Ethnicity	6,139	0,00000
Ingredients*Income	5,512	0,00000
Cleanliness*Gender	3,560	0,00028
Carbon footprint	2,912	0,00122
Cleanliness*Education	2,716	0,00192
Carbon footprint*Fast food Frequency	2,529	0,00296
Waiting time*Education	2,405	0,00394
Carbon footprint*Education	2,321	0,00478
Cleanliness*Income	2,056	0,00879
Cleanliness	1,966	0,01081
Ingredients*Age	1,935	0,01163
Ingredients*Work experience	1,794	0,01606
Waiting time*Age	1,760	0,01736
Caloric value*Fast food Frequency	1,540	0,02884
Price*Vegan Frequency	1,475	0,03353
Company*Work experience	1,360	0,04366
Price*Age	1,214	0,06108
Carbon footprint*Vegan Frequency	1,181	0,06588
Price*Education	0,631	0,23367
Company	0,464	0,34359
Waiting time*Vegan Frequency	0,426	0,37513
Price*Fast food Frequency	0,354	0,44275
Number of people	0,311	0,48849
Caloric value*Vegan Frequency	0,211	0,61454
Ingredients*Gender	0,185	0,65373
Ingredients*Fast food Frequency	0,064	0,86384
Waiting time*Fast food Frequency	0,050	0,89151
Price	0,009	0,97957
Waiting time	0,001	0,99820
Price	0,009	0,97957
Waiting time	0,001	0,99820
Caloric value	0,000	1,00000
Ingredients	0,000	1,00000
Number of people*Vegan Frequency	.	.

Table 43.2

Source	LogWorth	PValue
Ingredients*Vegan Frequency	11,779	0,00000
Ingredients*Grouped Ethnicity	6,395	0,00000
Ingredients*Income	6,292	0,00000
Ingredients*Fast food Frequency	5,361	0,00000
Carbon footprint	5,317	0,00000
Price*Fast food Frequency	4,509	0,00003
Carbon footprint*Fast food Frequency	4,387	0,00004
Price	4,339	0,00005
Cleanliness*Gender	3,350	0,00045
Carbon footprint*Education	3,340	0,00046
Caloric value*Fast food Frequency	2,528	0,00296
Cleanliness*Income	2,472	0,00337
Ingredients*Work experience	2,259	0,00550
Waiting time*Education	2,138	0,00728
Ingredients*Age	1,912	0,01224
Cleanliness*Education	1,863	0,01371
Waiting time*Age	1,840	0,01444
Waiting time	1,810	0,01548
Price*Age	1,727	0,01875
Company*Work experience	1,487	0,03260
Cleanliness	1,434	0,03677
Waiting time*Fast food Frequency	1,381	0,04156

Source	L-R ChiSquare	DF	Prob>ChiSq
Cleanliness*Gender	15,426	2	0,0004*
Price*Age	11,819	4	0,0187*
Waiting time*Age	12,428	4	0,0144*
Ingredients*Age	8,806	2	0,0122*
Ingredients*Grouped Ethnicity	44,794	8	<,0001*
Carbon footprint*Education	58,163	27	0,0005*
Waiting time*Education	27,178	12	0,0073*
Cleanliness*Education	16,008	6	0,0137*
Ingredients*Work experience	36,837	18	0,0055*
Company*Work experience	18,230	9	0,0326*
Cleanliness*Income	29,456	12	0,0034*
Ingredients*Income	52,478	12	<,0001*
Price*Fast food Frequency	49,177	16	<,0001*
Waiting time*Fast food Frequency	26,993	16	0,0416*
Ingredients*Fast food Frequency	39,282	8	<,0001*
Caloric value*Fast food Frequency	23,331	8	0,0030*
Carbon footprint*Fast food Frequency	79,431	36	<,0001*
Ingredients*Vegan Frequency	82,068	12	<,0001*
Waiting time	12,266	4	0,0155*
Price	25,204	4	<,0001*
Cleanliness	6,606	2	0,0368*
Carbon footprint	41,087	9	<,0001*

*Figure 33: Likelihood Ratio test for Non-veg*an ordinal analysis all variables Firth-Bias adjusted estimate turned off*

*Table 44.1 Veg*an ordinal analysis all variables except work experience/vegan frequency*

Source	LogWorth	PValue
Ingredients	42,377	0,00000
Carbon footprint	8,439	0,00000
Cleanliness*Grouped Ethnicity	2,910	0,00123
Number of people	2,871	0,00135
Cleanliness	1,918	0,01208
Price*Fast food Frequency	1,683	0,02077
Company	1,605	0,02485
Cleanliness*Income	1,560	0,02756
Number of people*Age	1,542	0,02871
Price	1,185	0,06526
Cleanliness*Gender	1,066	0,08590
Carbon footprint*Age	0,727	0,18751
Waiting time	0,568	0,27026
Waiting time*Age	0,395	0,40283
Cleanliness*Education	0,388	0,40890
Caloric value	0,283	0,52114
Waiting time*Education	0,188	0,64861
Waiting time*Fast food Frequency	0,124	0,75243

Table 44.2

Source	LogWorth	PValue
Carbon footprint	63,439	0,00000
Ingredients	56,963	0,00000
Cleanliness	7,191	0,00000
Waiting time*Education	7,003	0,00000
Cleanliness*Grouped Ethnicity	3,552	0,00028
Price*Fast food Frequency	2,787	0,00163
Price	2,109	0,00779
Company	2,021	0,00953
Cleanliness*Gender	1,603	0,02497
Cleanliness*Income	1,409	0,03899

Source	L-R ChiSquare	DF	Prob>ChiSq
Cleanliness*Gender	7,380	2	0,0250*
Cleanliness*Income	13,266	6	0,0390*
Waiting time*Education	56,449	12	<,0001*
Cleanliness*Grouped Ethnicity	25,460	6	0,0003*
Price*Fast food Frequency	31,533	12	0,0016*
Price	13,851	4	0,0078*
Cleanliness	33,116	2	<,0001*
Company	6,721	1	0,0095*
Ingredients	262,323	2	<,0001*
Carbon footprint	322,874	9	<,0001*

*Figure 34: Likelihood Ratio test for Veg*an ordinal analysis all variables except work experience/vegan frequency*

*Table 45.1 Veg*an ordinal analysis all variables Firth-Bias adjusted estimate turned off*

Source	LogWorth	PValue
Waiting time*Age	4,158	0,00007
Number of people*Age	1,989	0,01025
Cleanliness*Age	0,075	0,84134
Ingredients*Vegan Frequency	0,000	1,00000
Waiting time	0,000	1,00000
Number of people	.	.
Carbon footprint	.	.
Ingredients	.	.
Company	.	.
Caloric value	.	.
Cleanliness	.	.
Price	.	.
Cleanliness*Gender	.	.
Carbon footprint*Age	.	.
Cleanliness*Grouped Ethnicity	.	.
Cleanliness*Education	.	.
Waiting time*Education	.	.
Price*Work experience	.	.
Cleanliness*Work experience	.	.
Ingredients*Work experience	.	.
Number of people*Work experience	.	.
Cleanliness*Income	.	.
Waiting time*Fast food Frequency	.	.
Waiting time*Vegan Frequency	.	.
Price*Fast food Frequency	.	.
Price*Vegan Frequency	.	.
Cleanliness*Vegan Frequency	.	.

Table 45.2

Source	LogWorth	PValue
Carbon footprint	70,029	0,00000
Ingredients*Vegan Frequency	10,761	0,00000
Waiting time*Fast food Frequency	9,447	0,00000
Cleanliness	7,913	0,00000
Cleanliness*Work experience	5,776	0,00000
Price	5,235	0,00001
Number of people*Work experience	5,085	0,00001
Price*Work experience	3,696	0,00020
Ingredients	2,296	0,00505
Company	2,035	0,00922

Source	L-R ChiSquare	DF	Prob>ChiSq
Ingredients*Vegan Frequency	72,109	10	<,0001*
Waiting time*Fast food Frequency	69,745	12	<,0001*
Carbon footprint	353,860	9	<,0001*
Cleanliness	36,442	2	<,0001*
Cleanliness*Work experience	56,982	16	<,0001*
Number of people*Work experience	78,718	32	<,0001*
Company	6,780	1	0,0092*
Price*Work experience	68,182	32	0,0002*
Price	29,629	4	<,0001*
Ingredients	10,575	2	0,0051*

*Figure 35: Likelihood Ratio test for Veg*an ordinal analysis all variables Firth-Bias adjusted estimate turned off*

Marginal Probability	Marginal Utility		Ingredients
0,0097	0,00000		Meat
0,2491	3,24711		Meat-replacement
0,7412	4,33759		Plant-based

Figure 36: effect marginals for the different levels of Ingredients

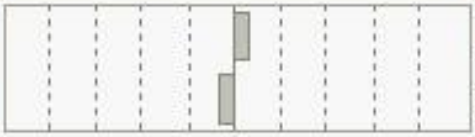
Marginal Probability	Marginal Utility		Company
0,7511	0,55220		McDonalds
0,2489	-0,55220		Subway

Figure 37: effect marginals for the different levels of Company

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