

ERASMUS UNIVERSITY ROTTERDAM

Erasmus School of Economics

Bachelor Thesis (Marketing)

The Modern Consumer

An Insight Into the Preferences for Veganism and
Effort in Food Consumption of the Modern Consumer

Name: Christiaan de Jager

Student number: 409275

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Introduction

In recent years, veganism has seen a tremendous growth in popularity. The numbers speak for themselves; consumption of meat-substitutes in the Netherlands increased 17% in 2017 as opposed to the year before, while at the same time retail sales of meat dropped with 1,7% (Knippenberg. 2018). The same goes for plant-based dairy substitutes, of which sales have increased with 6,6% over the same period, while dairy consumption has gone down 1,3%. People are adopting a vegan diet for various reasons, ranging from health associated to ethically based ones. Important influencers, like world famous musicians Beyoncé and Drake and world famous chefs Jamie Oliver and Gordon Ramsay, are promoting a vegan diet on their social media and thereby spreading the word about it.

Companies are adapting to this growing trend, to make sure they hop on the bandwagon as soon as possible, like Ben & Jerry's, who have recently released three non-dairy flavors ice creams alongside their regular flavors. Restaurant chains are of course also adapting to this development, like Vapiano, who have added a number of vegan options to their otherwise dairy- and meat-heavy menu, just like both Domino's Pizza and New York Pizza are now selling multiple vegan pizza varieties. Companies that specialize in vegan foods are also generating higher revenues than ever before, like Alpro for instance, a company that sells non-dairy versions of products like milk and yoghurt, which generated £157 million in just the United Kingdom in 2016, which is a growth of 21% compared to the year before, as stated by Robinson for Insider Media (2017).

These facts all point in the same direction: veganism is a trend that companies have to take into consideration for the future. Consumers seem to be more mindful of what they eat and what it does for their body and their surroundings. There is, however, another factor that plays an important part in the amount of utility consumers gain from food consumption: convenience. Buckey et al. state that the set of attributes demanded from any food product is extensive and that part of this set is based on the convenience of the product. This covers time and effort spent preparing and consuming the product, but also purchasing and storing it (2007).

These two factors, convenience and veganism, seem to play large parts in the modern consumers food preferences, but they don't seem to cooperate too well at

this point in time. Convenience food is generally highly processed and low in nutrients, whereas vegan meals are quite the opposite of this. These seemingly contradictory preferences could lead to great possibilities for companies and consumers and are therefore the focus of this research. The marketing research problem that follows from this is the following:

“Are the amount of effort one has to put into preparing a meal and the protein source of the meal important factors when making the decision to buy a certain meal, and if so, how important are they?”

This problem will be approached by conducting a survey containing both descriptive questions and choice sets. The results gathered from this survey will be used to calculate the amount of utility an individual would gain from different levels of effort and different protein sources and to calculate which other attributes of such a meal are important. Furthermore, the level of importance will be looked at as well, for each of these attributes.

Literature Review

This section will present insight into the introduced terminology and the current knowledge on the topics discussed, as to provide a solid foundation upon which can be built when processing and analysing the gathered data.

Veganism

Veganism refers to a lifestyle in which people abstain from the use of animal products, in any and all ways. The main focus is on dietary use, but clothing, furniture or other products are generally also taken into account as far as not consuming animal products. The term ‘vegan’ was coined in 1944, when several members of *The Vegetarian Society*, a group formed in 1843, requested a section in it’s newsletter devoted to non-dairy vegetarianism, which was declined. One of these members, Donald Watson, then started his own newsletter, which he called *The Vegan News*. The terms literal origin was very simple, as stated by Watson: “I settled for my own word, ‘vegan’, containing the first three and last two letters of

'vegetarian'—'the beginning and end of vegetarian.'" (2002). The movement was very small when it started, but gained some interest in the 1960's and 1970's, as a vegetarian movement spreaded throughout the USA and western Europe as part of the counterculture at that time. The most influential book during this time was Frances Lappé's 'Diet for a Small Planet' (1971), which sold over three million copies. After the hippie counterculture had lost its popularity, the rise of veganism stagnated and a cruelty-free lifestyle was mostly associated with punk subcultures and ideologies.

This changed, however, in the 2010's, when the diet became mainstream (Pendergrast, 2015). This trend has pushed through even stronger in the latter half of the decade, and it keeps growing (Jones-Evans, 2018). This general increase in interest is demonstrated by the increase in Google searches for them "vegan", which increased by 90% in 2016, up from a 32% increase the year before (Burt, 2012). The world's first vegetarian 'butcher' shop opened in 2010 in the Netherlands, simply called The Vegetarian Butcher (De Vegetarische Slager). Similar stores opened throughout the world after this. In 2011 the first completely vegan supermarkets opened in Dortmund and Berlin, called Vegilicious and Veganz. As these facts show, the world has been accepting and adapting to veganism and it is becoming more and more mainstream. At this point in time, there are no signs of a veganism-fatigue, the diet seems to gain more popularity everyday, helped significantly by big influencers, as mentioned in the introduction, and powerful documentaries like Cowspiracy and What The Health by filmmaker Kip Anderson.

Convenience Food (Effort)

As described by Anderson and Deskins, convenience food is commercially prepared food for ease of consumption (1995). This is a very broad description and can therefore still include many types of products: hot, ready-to-eat meals; room-temperature, shelf-stable products that can be consumed without heating or cooling at any given time, and frozen or refrigerated foods that have to simply be heated to consume (Health and Age Center, 2008). Another description for convenience foods is foods that are designed as to be more appealing to the consumer (Boosalis, 2007). The main quality that makes the aforementioned foods

more appealing is of course their time saving characteristic. It can be argued that convenience foods are the middle ground between preparing food from scratch and restaurants, since they are generally more expensive than home cooking, but cheaper than restaurants and they are more time efficient than home cooking, but less time efficient than restaurants, since they usually still require 5-15 minutes to prepare for consumption.

Convenience food is shown some light on here, because it is essentially the embodiment of demand for low preparation times for meals and thus the effort one wishes to exert to generate a meal, which will be of importance in this research. GlobalData, a leading data and analytics company, recently reported that the UK food and grocery convenience market is projected to grow 4.1% in 2018 and that the highest growth category, the convenience food category that is, will grow a staggering 22,0% in value for the period of 2017-2022. This growth be driven by food-on-the-go and an increased proportion of fresh food in convenience (GlobalData Retail, 2018). This last statement is in harmony with the increasing trend of veganism and gives hope for a fruitful conclusion to this research, as this is of course closely related to the main research question posed above.

Methodology

To perform this research, an online survey was created using Qualtrics. The survey was conducted during the breaks of three lectures on the Erasmus University. Two types of questions are asked in the survey: descriptive questions and choice sets. These queries amount to a total of seventeen questions. As for the descriptive questions, the first six are quite standard and regard matters like gender and location. The latter three questions are more exploratory, as they are meant to gather information on how the participants view veganism and the impact it has. These questions are asked with a seven-point Likert scale (strongly agree - strongly disagree) multiple choice answer option, which means that the seven options given start from 'strongly agree' and gradually fall to 'strongly disagree' over these seven multiple choice answers .

The variables generated by these questions are the following: each respondent's age (denoted by the variable 'Age'), gender ('Gender'), country of

residence ('Country'), annual income ('Income'), highest level of education ('Education'), current occupation ('Occupation'), whether the participant believes he lives an environmentally conscious lifestyle ('Lifestyle'), their opinion on the effect of a plant-based diet on the human body ('Body') and their opinion on the effect of a plant-based diet on the planet ('Planet'). The purpose of these descriptive questions is twofold - first, they allow us to understand the composition of the sample group; second, they are meant to help explain the results gained in the choice set part in a better way.

The remaining (and chronologically speaking middle) part of the survey consists of eight choice sets with an additional explanatory statement beforehand to clarify the situations presented in the choice sets. These choice sets contain different types of meals. The participant is asked to choose between two different meals, eight times in a row in which no combination of meals is the same. They are presented in a completely random order. This means that the choice sets are presented in a random order to each individual and that the two options within the sets are also stated in a random order each time. This is done to prevent a choice order bias from arising. The meals are described by four characteristics: price, protein source, preparation time and type of dish. The different levels are shown in Table 1 below. All questions that were asked in the survey, together with the explanatory statement that was placed in front of the choice sets, can be found in the Appendix.

<u>Attributes</u>	<u>Level 1</u>	<u>Level 2</u>	<u>Level 3</u>
Price	€8	€10	€12
Protein Source	Meat/Fish	Vegetarian	Plant Based
Preparation Time	0 -15 min.	15 - 30 min.	30 - 45 min.
Type	Hot	Cold	-

Table 1: All level of the attributes in the product space that were used in the survey.

The data collected from Qualtrics is downloaded into an Excel file where it is transformed to match the format of the choice experiment design in JMP, the data analysis software that will be used during this research. Values for the response indicator and the survey responses are imported into the choice profile table in JMP and a choice model is from these choice sets. Additional choice models are ran for each of the descriptive variables to investigate possible interaction effects. The choice model reports of interest are the parameter estimates, the likelihood ratio tests, effect marginals, and the utility profiles each of which will be detailed in the results section.

Data

In the following section, a discussion of the data collection, the variables and the descriptive statistics will be presented, which will facilitate a better understanding of the gathered data.

Data collection

The sample that was collected consisted of 120 different individuals' answers. These individuals were all students, as mentioned before, since the survey was conducted during three different lectures on the Erasmus University. These lectures were for three different courses in different study programmes; Intermediate Accounting (Dutch) from the second year of the Economics and Business Economics programme, Intermediate Accounting (English) from the second year of the International Bachelor of Economics and Business Economics programme and Learning Man (English) from the first year of the Psychology programme. This was done to avoid the possibility of people participating twice in the study and to broaden the sample a bit. Of course, these are all still students, but they are not only third year Dutch Economics students, which diversifies the sample a bit more.

The students were shown a QR-code and a URL-link on the screen in the lecture rooms at the start of the break in these lectures, which both led to the online survey. They were then simply asked to fill in the survey during the break to help provide data for this study. There were no further (monetary) stimulants and the only way for the students to access the survey was through the presented links.

Variables

To create the right choice sets to present in the survey, the product space presented in Table 1 above was entered into JMP, which was then used to generate eight choice sets that would be used to generate all necessary data. These choice sets can be found in the Appendix, within the survey that was presented. The attributes that were used represent four variables that are of importance to the research:

- The price level is of course important, because it signifies the willingness-to-pay of an individual for a certain meal.
- The protein source indicates how much the individual cares about whether the meal is plant-based or not. This does not signify, however, that if they do care about whether the meal contains animal products, that they do so because of a certain motivation. This study will only be able to show whether there is a significant effect, not what causes this effect.
- The preparation time is the attribute that represents how much the individual cares about the amount of effort one has to exert to prepare the meal.
- The type of meal indicates how much the individual cares about whether the meal is served as a cold or hot dish.

These variables will be tested for significance and will be interpreted if they are indeed significant in the analysis below.

Descriptive statistics

A selection of the descriptive statistics that were formulated from the gathered data can be found in Table 2. This table shows that the sample set is relatively young on average; 20.93 years. Out of 120 respondents, 114 live in the Netherlands, which is only logical when all respondents were in a lecture room at the Erasmus University Rotterdam. All but one of the respondents are currently a student, which is again fairly obvious. This means that there are limitations to this research, since all participants were students on the Erasmus University. Conducting the survey this way was, however, the most efficient way to collect a sizeable amount of data and

the bias that this particular way generated is an evident one, which is preferable if one does have a bias in their results. This limitation (and possibly others) will be discussed further down in the designated chapter.

	Mean	Standard Deviation	Median	Mode	Frequency of Mode
Age	20,93333333	3,010352508	20	20	37
Gender	1,558333333	0,4965855638	2	2	67
Country	118,075	17,77599622	122	122	114
Income	1,083333333	0,3570027736	1	1	112
Occupation	1,05	0,5477225575	1	1	119

Table 2: A selection of descriptive statistics, generated from the collected data

After the choice set questions, three more descriptive questions are asked. The first question asks whether the participant believes they live an environmentally conscious lifestyle. The two questions that follow regard the participant's view on plant based meals and their influence on both the human body and the planet. These questions are asked to gain insight into the participant's view on veganism and the influence it might have. This could be an important to take into account when analysing the results gathered from the choice sets.

Results

The conducted survey has generated a sample size of 120 completed surveys, which presented a fairly decent amount of usable data. This data will be described and analysed below in order to answer the research question in four different paragraphs.

Attribute Significance

The main point of interest in this research is to determine which attributes in the abovementioned product space were significant in the choices that the participants made. In the Appendix, Figure 1 shows the results that were generated using JMP without any further interaction effects. This includes the regression

coefficients for each attribute to the overall utility of the meal characteristics. The significance of these attributes is determined through likelihood ratio tests for each attribute. Using a test like this makes it possible to compare the attributes of interest, which in this case, are of course the needed effort and the protein source. The tables that follow Figure 1 in the appendix (Figures 2 - 10) present similar results as Figure 1, except in each of these tests, a specific correlation effect is being tested for (i.e. Age, Country, etc.). More on these results will be discussed below.

The likelihood ratio test shown in Figure 1 indicates that all attributes are of significance at a 5% significance level, except for the price level, which requires a 10% confidence interval to be considered significant. More importantly, both the protein source and the preparation time are significant factors in the purchase preferences of the participants.

Interaction effects

As mentioned above, besides the eight chose sets, nine descriptive questions were asked. These questions were asked to gather data, which would allow for the testing of whether there are other factors that have significant effects on the choice decisions that were made. The data gathered regarding these descriptive variables was used to make new separate regressions with JMP, to see whether there are significant interaction effects. These results can be found in Figures 2 - 10, as stated previously.

The first thing that can be stated about the results depicted in the figures, is that there are three descriptive variables that, when added, cause no significant interaction effects: 'Education', 'Income' and 'Lifestyle'. These factors can therefore be disregarded in terms of interaction with the choice variables in the sample that was collected and are not particularly useful to this study. This means, however, that the other six descriptive variables do present one or more significant interaction effect(s). These will now be named and interpreted.

'Age' has a significant interaction effect on all four variables within the product space: 'Protein Source', 'Preparation Time', 'Price' and 'Type'. Starting with 'Protein Source', if it is Meat/Fish and 'Age' goes up by 1, the utility of the consumer goes down by 0.1219, if 'Protein Source' is Vegetarian, their utility goes up by 0.0604 and

if 'Protein Source' is Plant Based, their utility goes up by 0.0615. As for 'Preparation Time', if it is 30 - 45 min. and 'Age' goes up by 1, the utility of the consumer goes down by 0.0736, if 'Preparation Time' is 15 - 30 min., their utility goes down by 0.0294 and if 'Preparation Time' is 0 - 15 min., their utility goes up by 0,1030. Next is 'Price'; if it is €12 and 'Age' goes up by 1, the utility of the consumer goes down by 0.0468, if 'Price' is €10, their utility goes down by 0.0345 and if 'Price' is €8, their utility goes up by 0.0813. Finally, if 'Type' is Cold and 'Age' goes up by 1, the utility goes down by 0.0797 and thus if 'Type' is Hot, their utility goes up by 0.0797. These results can be interpreted as follows: as consumers get older, they tend to gain more utility from meals that contain no meat or fish and the most from plant based meals. Furthermore, they gain more utility from having a lower preparation time, they prefer the lower price and they prefer their meals hot.

'Gender' has a significant interaction effect with three of the four variables, namely 'Protein Source', 'Preparation Time', and 'Price. First off, if 'Protein Source' is Meat/Fish and 'Gender' is Male, the utility of the consumer goes up by 0.8878, if 'Protein Source' is Vegetarian, their utility goes down by 0.0609 and if 'Protein Source' is Plant Based, their utility goes down by 0.8269. The inverse happens when 'Gender' is female, which means that, if 'Protein Source' is Meat/Fish, the utility of the consumer goes *down* by 0.8878, for Vegetarian it goes *up* by 0.0609 and for Plant Based it goes *up* by 0.8269. Then for 'Preparation Time', if it is 30 - 45 min. and 'Gender' is Male, the utility of the consumer goes up by 0.5039, if 'Preparation Time' is 15 - 30 min., their utility goes up by 0.2302 and if 'Preparation Time' is 0 - 15 min., their utility goes down by 0,7341. Again, if 'Gender' is Female, the opposite happens, so the utilities go down instead of up and vice versa with the same amount. Lastly, if 'Type' is Cold and 'Gender' is Male, the utility of the consumer goes up by 0.5169, and if 'Type' is Hot, their utility goes down by 0.5169. In this case, like before, the inverse is the case if 'Gender' is Female. Interpreting these results will depict that, in this particular sample, male participants gain more utility from meals containing meat than they do vegetarian or plant based meals, do not mind a longer preparation time and prefer cold meals. The female participants, on the other hand, prefer plant based meals over the other two protein sources, appreciate a shorter preparation time and prefer a dish served hot.

As shown in Table 2 above, only 6 of the 120 participants do not currently reside in the Netherlands (probably indicating that they are exchange students, since they were in a lecture room on the Erasmus Campus in Rotterdam). Even though 'Protein Source', 'Preparation Time' and 'Type' do show significant effects in Figure 4 in the Appendix, the interaction effects shown for the 'Country' variable are not easily interpreted in a correct manner nor are they very useful, because of the skewed sample in terms of country of residence. These results will therefore be omitted in the remainder of this research.

Similar to the 'Country' case, Table 2 shows that 119 out of 120 participants gave the same value for 'Occupation'; Student. Again, the results shown in Figure 6 show a significant interaction effect, this time only for the 'Type' attribute. This variable will also be omitted, for the same reason as the 'Country' variable, in the remainder of this research.

The 'Body' variable has a significant interaction effect with only one of the variables, which is 'Protein Source'. The question asked for the 'Body' variable has answers on a seven-point Likert Scale of 'Strongly Agree' to 'Strongly Disagree', which means that if the value goes up by 1, the participant agrees less with the posed hypothesis than before. If the 'Protein Source' variable equals Meat/Fish and 'Body' goes up by 1, the utility of the consumer up by 0.2146, if 'Protein Source' is Vegetarian, their utility goes down by 0.0480 and if 'Protein Source' is Plant Based, their utility goes down by 0.1666. This is interpreted as follows: when an individual agrees one point less on the scale with the posed hypothesis that a plant based diet is more beneficial for the human body than a non-plant based diet, their utility goes up when a meal has a non-plant based protein source. This also implies that if a person agrees one point more with this hypothesis, they prefer a plant-based meal more than one with a vegetarian or animal protein source.

The last variable is 'Planet', which has a significant interaction effect with all four variables. Like with the 'Body' variable, the question was asked with answers on a seven-point Likert Scale of 'Strongly Agree' to 'Strongly Disagree'. As for 'Protein Source', if it is Meat/Fish and 'Planet' goes up by 1, the utility of the consumer goes up by 0.2942, if 'Protein Source' is Vegetarian, their utility goes down by 0.1552 and if 'Protein Source' is Plant Based, their utility goes down by 0.1390. Then with

'Preparation Time', if it is 30 - 45 min. and 'Planet' goes up by 1, the utility of the consumer goes up by 0.1764, if 'Preparation Time' is 15 - 30 min., their utility goes up by 0.0900 and if 'Preparation Time' is 0 - 15 min., their utility goes down by 0,2664. Third, if 'Price' is €12 and 'Planet' goes up by 1, the utility of the consumer goes up by 0.1363, if 'Price is €10, their utility goes down by 0.0205 and if 'Price' is €8, their utility goes down by 0.1158. Lastly, if 'Type' is Cold and 'Planet' goes up by 1, the utility goes up by 0.2432 which means that if 'Type' is Hot, their utility goes down by 0.2432. Interpreting these results goes accordingly: as an individual agrees less with the posed hypothesis that a plant based diet is more beneficial to the planet than a non-plant based diet, they prefer a meal with meat or fish more than a vegetarian or plant based meal, they prefer a longer preparation time, they are prepared to pay more and they gain utility from a cold meal. The other side of this interpretation is that individuals that agree more with this hypothesis prefer plant based or vegetarian meals, a lower preparation time, a lower price and a hot meal instead of a cold one.

Effect Marginals

To measure which attributes are more important in the decisions individuals made about the different meals, an effect marginals report was created from the choice model, both with and without the descriptive variable. This report contains values for the marginal probabilities for each level of all attributes. In Figure 1 in the Appendix, the marginal probability of a 'Price' value of €8 is 0.3814. This indicates that the probability that an individual would choose a meal with a price of €8 over a meal with €10 or €12, everything else being equal, is 38.14%. For a price of €10, the marginal probability is 29.68% and for €12 it is 32.18%.

The marginal probability for a 'Protein Source' with the Meat/Fish value is 0.5688, for Vegetarian it is 0.2328 and for Plant Based it is 0.1984. All other attributes equal, an individual would choose a meal with meat or fish as its protein source over a meal without is 56.88%, they have a 23.28% probability to choose a vegetarian meal over the other options and a 19.84% probability to choose a plant based meal. As for 'Preparation Time', the marginal probability of an individual choosing a meal with the value 30 - 45 min., everything else being equal, is 26.26%,

for 15 - 30 min. that is 47.37% and for 0 - 15 min. it is 26.37%. Finally, for 'Type' the marginal probability for 'Cold' is 75.72%, with everything else held equal, and for 'Hot' that is 24.28%.

The 'Effect Marginals' section in Figure 1 also shows the marginal utilities for the different variables of the attributes, which are the same figures as the interpreted coefficients above. Next to these utilities are the utility spans, which visualize these marginal utilities in a relative manner as to make it easier to compare the importance of the different attributes in individuals' choices. The most important attributes in this sample are therefore 'Protein Source' and 'Type', while 'Price' is the least important by far. Figures 2 - 10 also contain Effect Marginals sections, which differ slightly from the ones presented in Figure 1, but they present a very similar pattern. Therefore, these marginals sections will not be discussed at this point.

Utility Profiler

A utility profiler report assigns a utility to each possible combination of attributes, which in this research are all the different meals that can be created, and makes it possible to rank these meals from the most to the least attractive for this sample. The utility profiler output can be found in Figure 11 in the appendix and was again created with JMP. The most attractive meal, based on this utility profiler report, would be one at the lowest price level of €8, a vegetarian protein source, with the highest preparation time of 30 - 45 min. and is served cold. On the other hand, the least attractive meal is one is at the highest price level of €12, also has a vegetarian protein source, also has the highest preparation time of 30 - 45 min., but is served hot.

In this particular sample, as can be seen in Figure 11, it is hard to find a trend based on this utility profiler report. For example, the meals with the five highest utilities, two of them have a vegetarian protein source and three of them have the value meat/fish, the preparation time is divided even more with and the type is also divided like the protein source. The only thing that is slightly coherent is the price level, because four of them are the lowest one of €8 and the remaining one is the middle price point of €10. But when looking at all positive utility combinations, of which there are 28 in total, a different result appears. In Table 3 below, all

possibilities for each attribute were counted for the positive utility combinations and the highest count has been highlighted. Based on these results, the most meals that result in a positive utility for an individual, the price tag is €12, it has a vegetarian protein source, has a preparation time of 0 - 15 minutes and is served hot. The differences are, however, very small and this further supports the statement that is hard to find a trend in this report.

	Low	Mid	High
Price	(€8) - 8	(€10) - 9	(€12) - 11
Protein Source	(Plant Based) - 6	(Vegetarian) - 12	(Meat/Fish) - 10
Preparation Time	(0 - 15 min.) - 11	(15 - 30 min.) - 7	(30 - 45 min.) - 10
Type	(Hot) - 17	(Cold) - 11	

Table 3: An accumulation of the counts of results that are found in positive utility meal combinations.

Discussion

To answer the research question, the analysis presented above will now be discussed. When looking at the effect marginals, specifically the marginal probabilities, the dominant factors in the decision making process are 'Protein Source' and 'Type', with 'Preparation Time' being a close third and 'Price' not seeming to be important at all. This says a couple of things; firstly, both variables that were thought to be important to individuals and were the main focus of this research, the protein source and the preparation time, were indeed very important in the decision making process. Another notable outcome here is that price seems to be a non-issue for the participants of the research. This could mean a couple of things; first off, the prices that were used might have been too close to each other. Secondly, the prices might have been too low, making it so that individuals thought of them as very affordable any which way, or perhaps the opposite was the case; individuals thought the prices were too high anyway. Lastly, the importance of 'Type' is a bit of an anomaly. It was not expected to have such an influence and such a wide spread. This simply states that the individuals in this sample have a very mixed preference for the way their food is served.

Based on the utility profiler analysis described above, it is hard to formulate a single answer to the research question. The utility profiler report shows that there is a slight preference for a shorter preparation time. It also seems that there is a preference for a vegetarian protein source and a hot meal, but counterintuitively, the highest price point of €12 also seems to be the preferred option. The differences are so small, however, that these statistics do not present a convincing conclusion.

Moreover, the significant descriptive variables described in the Interaction Effects subchapter should also be taken into account. Especially 'Age' and 'Gender' are important in this sample, since they have significant interaction effects on four and three of the attributes respectively, as described above. As for 'Age', the older the individuals got, the more they cared for plant based meals as opposed to meals containing meat or fish. Additionally, they preferred a lower preparation time as they got older as well. 'Gender' shows that females have a greater tendency to prefer meatless meals and prefer a shorter preparation time. The third descriptive statistic that has significant interaction effects, is the 'Planet' variable. This variable essentially showcases how much an individual thinks that consuming plant based meals is preferable for the planet as opposed to consuming non-vegan meals. The results here are as one could predict: the more an individual agrees with this statement, the more they prefer plant based or vegetarian meals. Individuals also tend to lean more towards a shorter preparation time as they agree more with this statement. Finally, the 'Body' variable, which shows the agreement with a similar statement as 'Planet', except this hypothesis is about the human body, showed a similar intuitive outcome: as an individual agrees more with the hypothesis, they gain more utility from a plant based meal.

Combining all the analyzed statistics summarized here into a segment to target is quite the task, but the data does shed some light on the topic. It seems that, based on this sample, a more mature female target would be optimal. As for pricing, further research should be done as to whether prices could be higher or should be lower, since there was no clear outcome on this. Targeting an audience that agrees with the statements posed in 'Body' and 'Planet' might be a tougher ordeal, but those statistics could be taken into account as well during the creation of the marketing strategy of a plant based product.

Limitations

As has been stated multiple times before in this paper, there are some obvious limitations to the results that were generated by this research, most of which are caused by the sample. The sample consists of 120 individuals who got to participate in the survey, because they were in a lecture room in the Erasmus University in Rotterdam. This, of course, limits the validity of the research significantly. As shown in Table 2, 119 of the 120 participants were in fact students, alluding to the fact that the remaining one participant was most likely a lecturer. This means that almost the entire sample is relatively young, has a low income, does most likely not have a family to support, is perhaps less interested in the effects of the food they consume on their body or environment and has a lot of individuals with similar interests and overall lifestyles.

All of these characteristics can (and most likely will) cause biases and therefore distort the representativeness of the sample. If similar research would be conducted, the sample should of course be as random as possible and this could be achieved in a number of relatively easy ways, given certain financial support. This will be discussed more in the Future Research chapter.

Another limitation to this research is the fact that it is based on a survey instead of actual observational data. This makes it so that participants can say that they would choose a more expensive option, for instance, without having to actually pay for it. This lifts a certain amount of pressure, especially for participants with a relatively low income. Furthermore, it cannot be guaranteed that participants give their actual answers in a survey, since there is no motivation to be truthful other than altruism. When looking at observational data, one looks at decisions people make in their actual lives, which makes the data more dependable and less prone to these issues of truthfulness and motivation. Gathering data of this sort is, however, very capital intensive and takes a lot of time and therefore not possible for this research.

Managerial Implications

Even though there are quite a lot of limitations to this research, it could still be useful to managers of certain firms. There seems to be quite a lot of attention for the protein source in meals in this sample, just like there is quite a lot of attention for

preparation time. Given that this sample is almost entirely filled with students, one could argue that this research is internally valid when looking to market to students, especially university students residing in the Netherlands. In that case, the take away would be that females tend to prefer plant based meals more than males and that, as students get older, they also tend to gain more utility from plant based meals. For both of these cases, a lower preparation time seems to be beneficial as well.

Based on this research, the preferred target is therefore females who are on the verge of becoming young professionals, if one wants to market plant based convenience foods. On the other side of the spectrum, if one wants to market a meat-based meal that requires a longer preparation time, one should look towards the younger male demographic. Of course, managers could take this research and validate it by replicating it or performing a similar study on a different segment, which would fit their targeted segment better. In that case, different and perhaps better suited descriptive variables could be integrated into the research, to make for an even better fit of the research. These are, of course, not direct implications to be taken from this research, but mere suggestions in case a similar study is desirable.

Conclusion

The research that was conducted has provided insight into the utilities that individuals might gain from a certain amount of effort invested into a meal, which has a certain protein source. The research has a myriad of limitations at this point, which take away from the validity of this research, but which could be reduced in future attempts at conducting it. From this research, keeping these limitations in mind, one could conclude that females who are becoming young professionals are the best group to target for companies who want to profit from low-effort, plant based meals, since they gain the most utility from these factors. Further implications seem to be hard to conclude from this particular research.

Further Research

This research is very relevant and could prove to be very useful if done in a more valid way. Therefore, the sample should be bigger and as random as possible.

The most cost efficient way to achieve this would most likely be to hire a survey company to distribute the survey in a random matter to a bigger sample.

As stated above, a similar study could also be performed with observational data, which would be even more preferable, but more capital intensive. This would make for a more realistic and accurate study overall, with higher validity across the board. As for improvements on the actual content of the survey, other descriptive variables could be added to check for more interaction effects and get a more accurate view of participants' preferences. Similar research would seemingly be beneficial to conduct in the near future, since the topics discussed are very relevant and are currently very important, so the hope is that this research motivates other researchers to go out and conduct improved versions of this research.

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Appendix

Survey questions:

- 1: What is your age?
- 2: What is your gender?
- 3: In which country do you currently reside?
- 4: What is your annual income?
- 5: What is your current field of occupation?
- 6: What is your highest level of education?
- 7: (Statement) For the following eight questions, you will be asked to choose between two different meals. These meals are for **two** people and are to be prepared at home. The meals will be described by four different values. A short description of these values will now follow:

Price: the price of the ingredients used in the meals.
Protein Source: either Meat/Fish, Vegetarian (which contains dairy and eggs) or Plant-based.
Preparation Time: the time it takes to prepare the meal.
Type of Dish: the way the dish is served, hot or cold.

If these terms are understood, please continue.

8 - 15: Please select your most preferred option.

16: I live an environmentally conscious lifestyle.

17: A plant-based diet (consisting only of non-animal products) is more beneficial for the human body than a diet including animal products.

18: A plant-based diet (consisting only of non-animal products) is more beneficial for the planet than a diet including animal products.

Complete survey can be found at:

https://erasmusuniversity.eu.qualtrics.com/jfe/form/SV_b7rCqIDbzmM4IBb

Figure 1: The generated results in JMP without any descriptive variables included

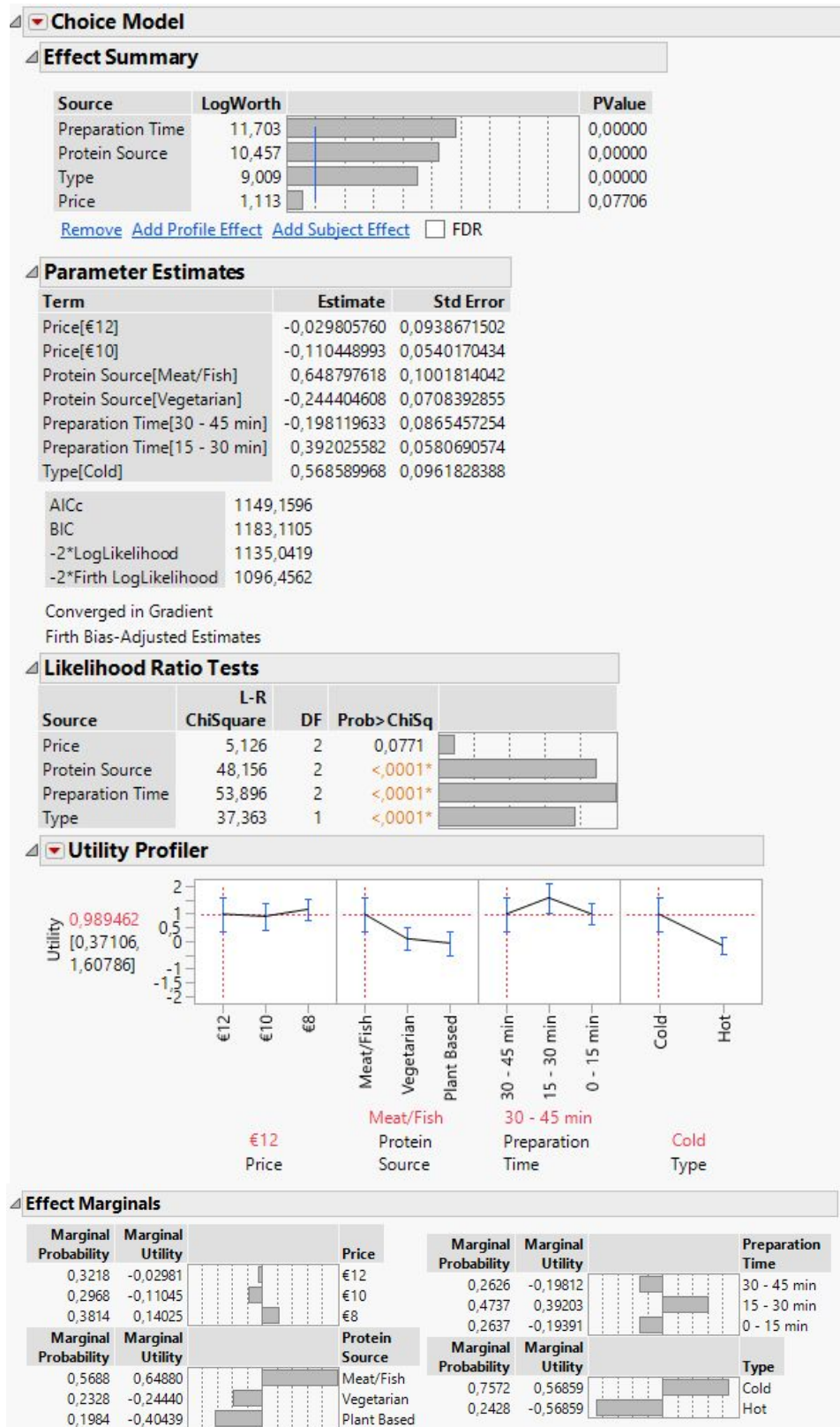


Figure 2: The generated results in JMP with 'Age' added as variable

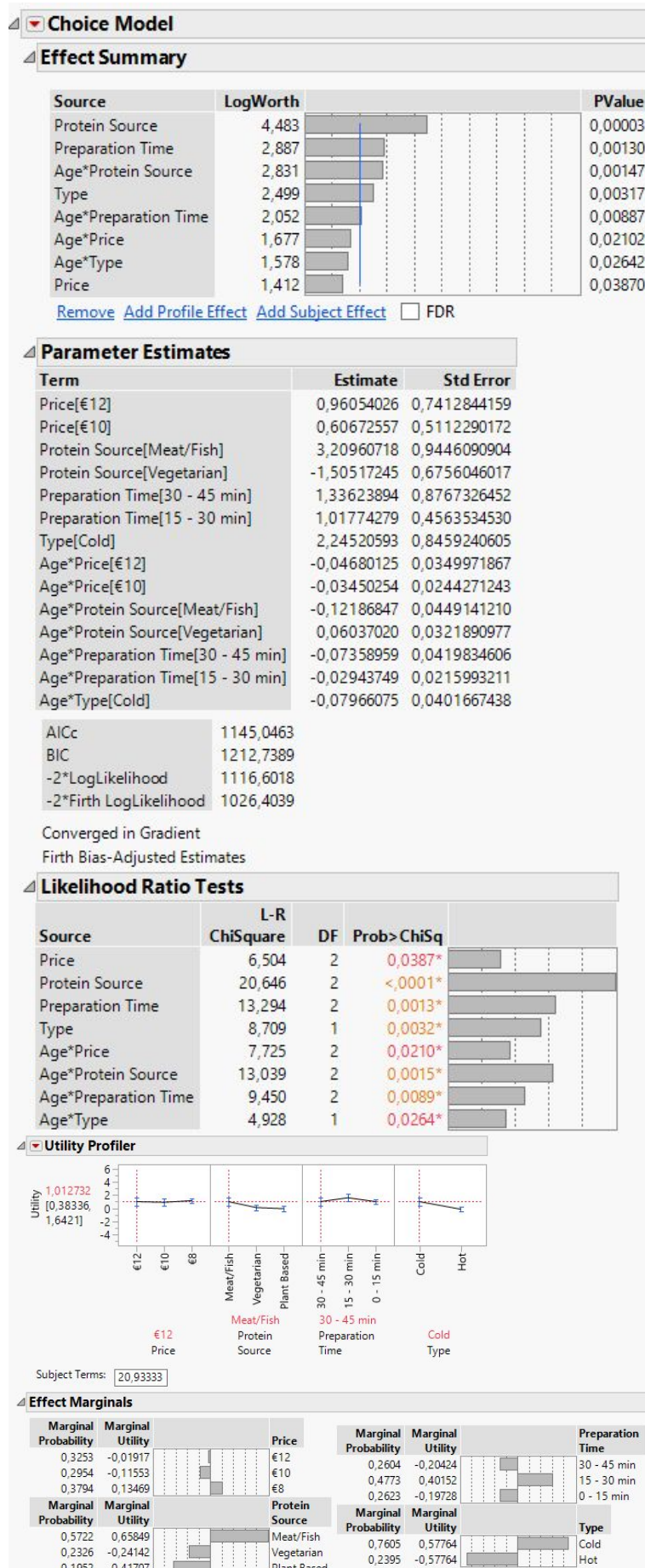


Figure 3: The generated results in JMP with 'Gender' added as variable

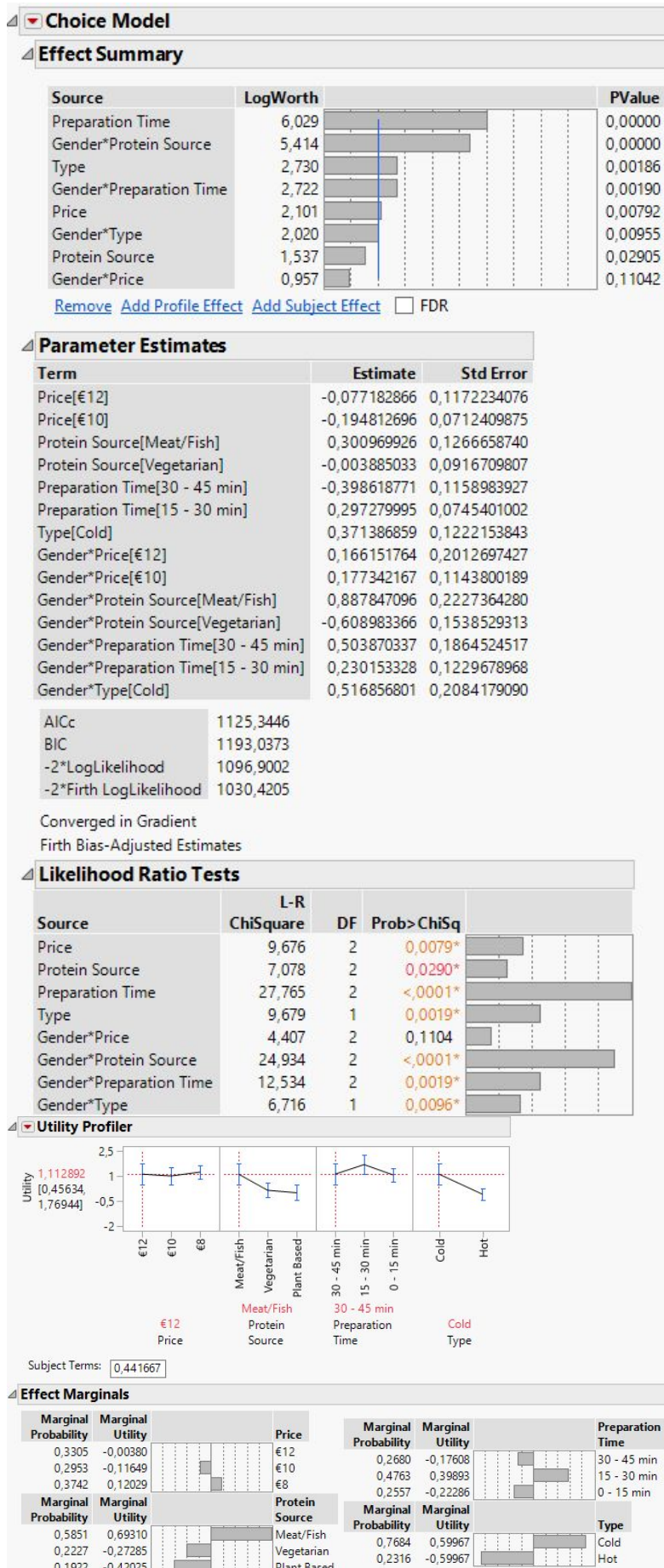


Figure 4: The generated results in JMP with 'Country' added as variable

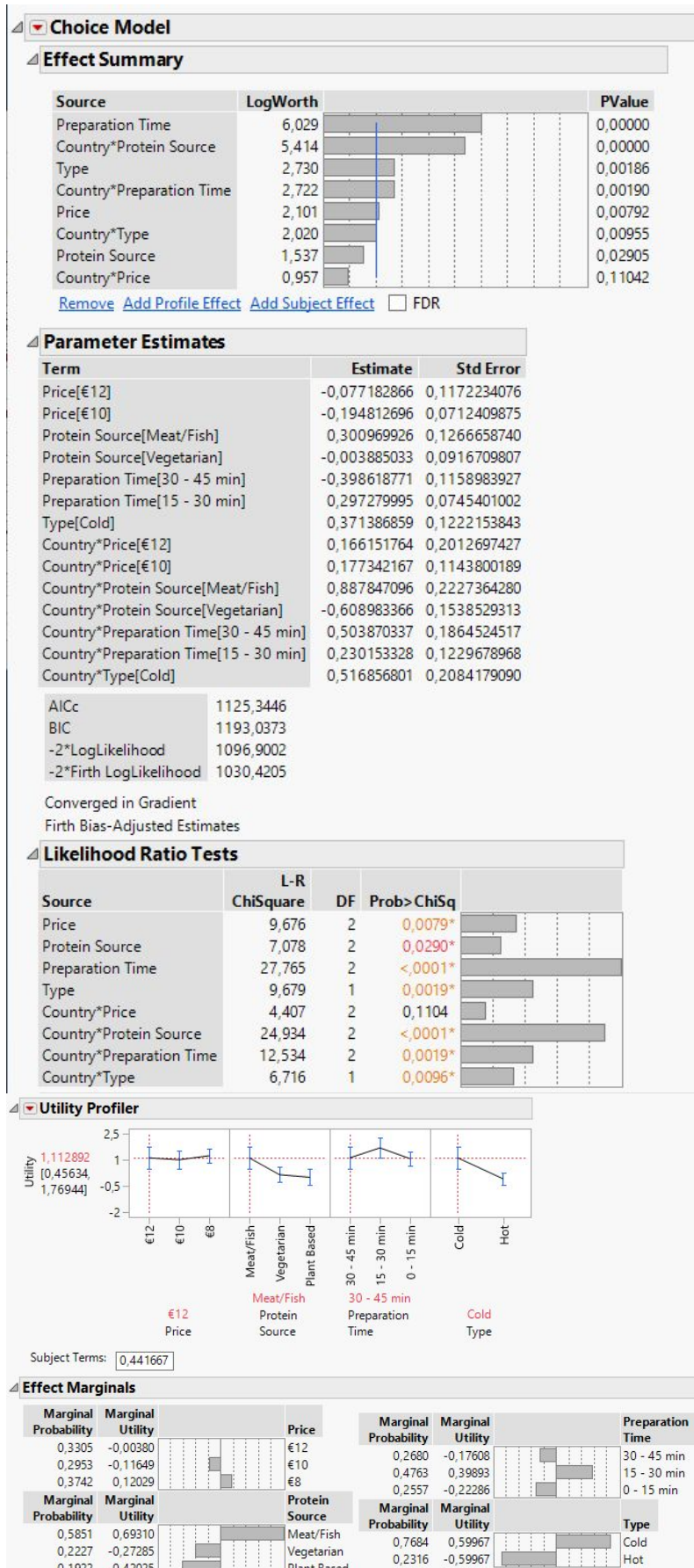


Figure 5: The generated results in JMP with 'Income' added as variable

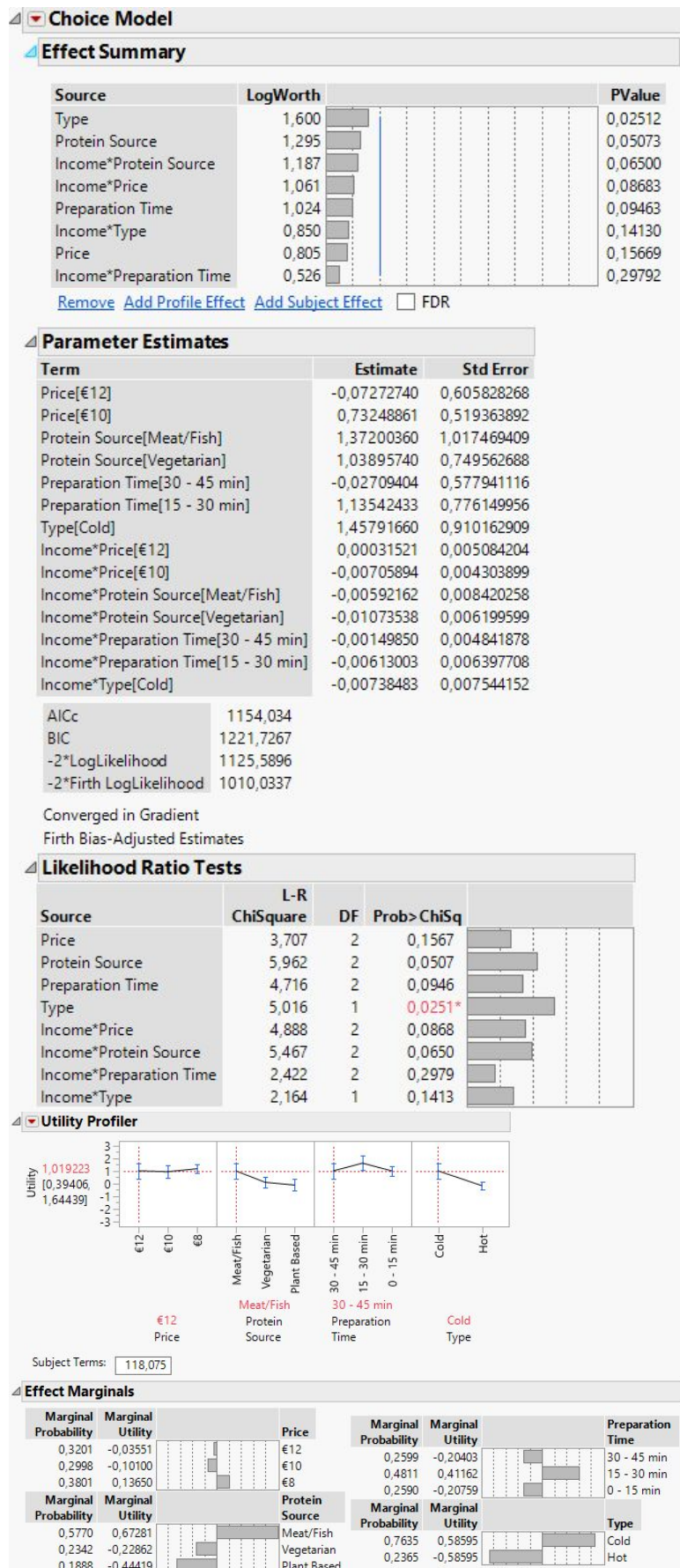


Figure 6: The generated results in JMP with 'Occupation' added as variable

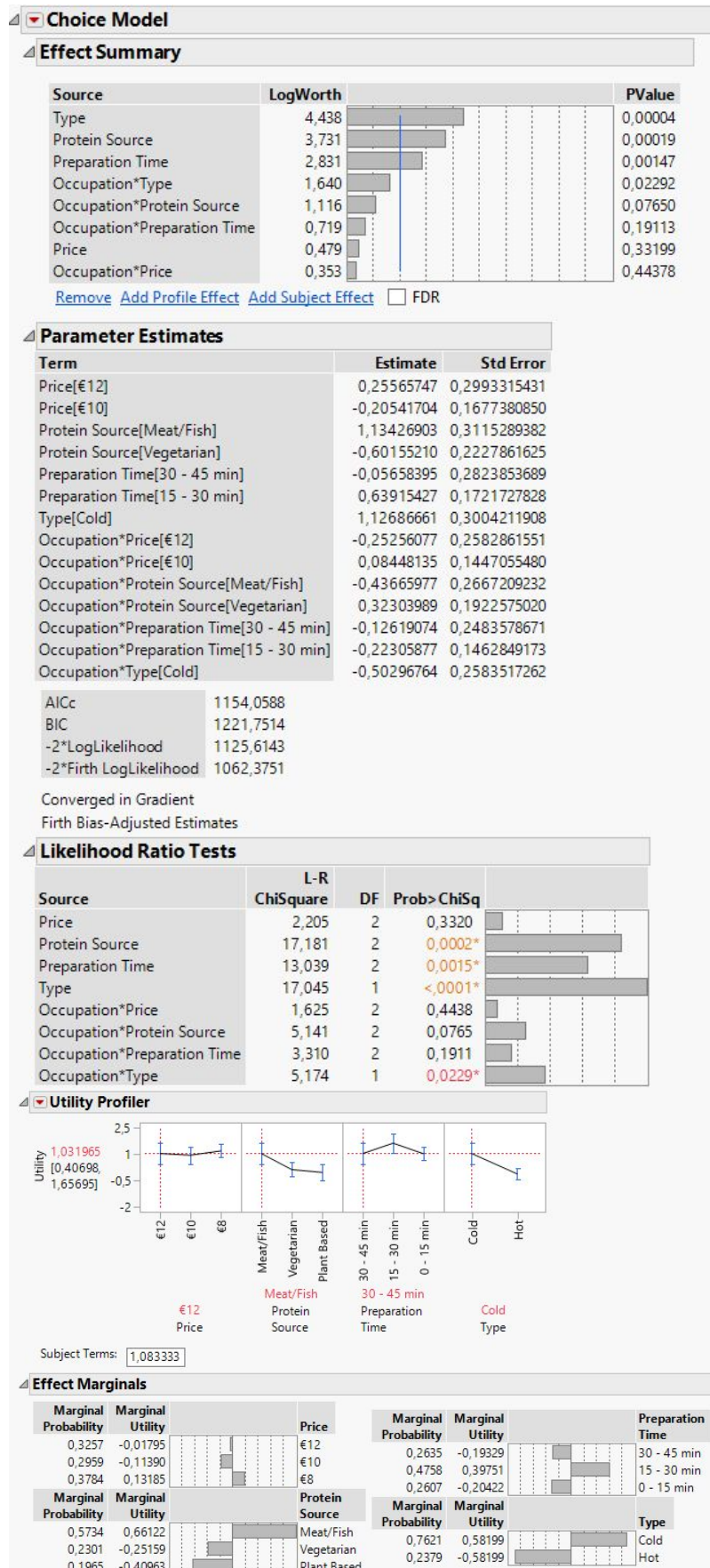


Figure 7: The generated results in JMP with 'Education' added as variable

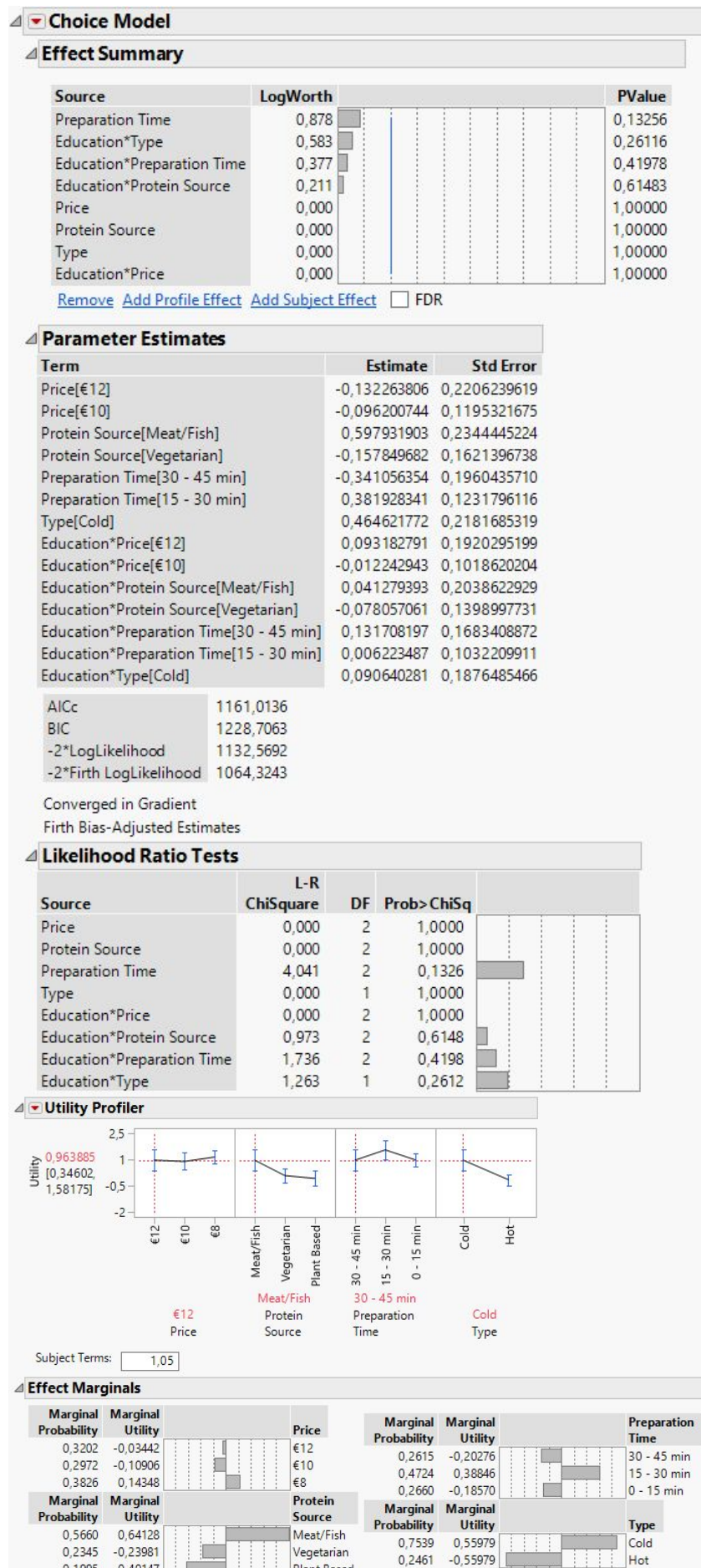


Figure 8: The generated results in JMP with 'Lifestyle' added as variable

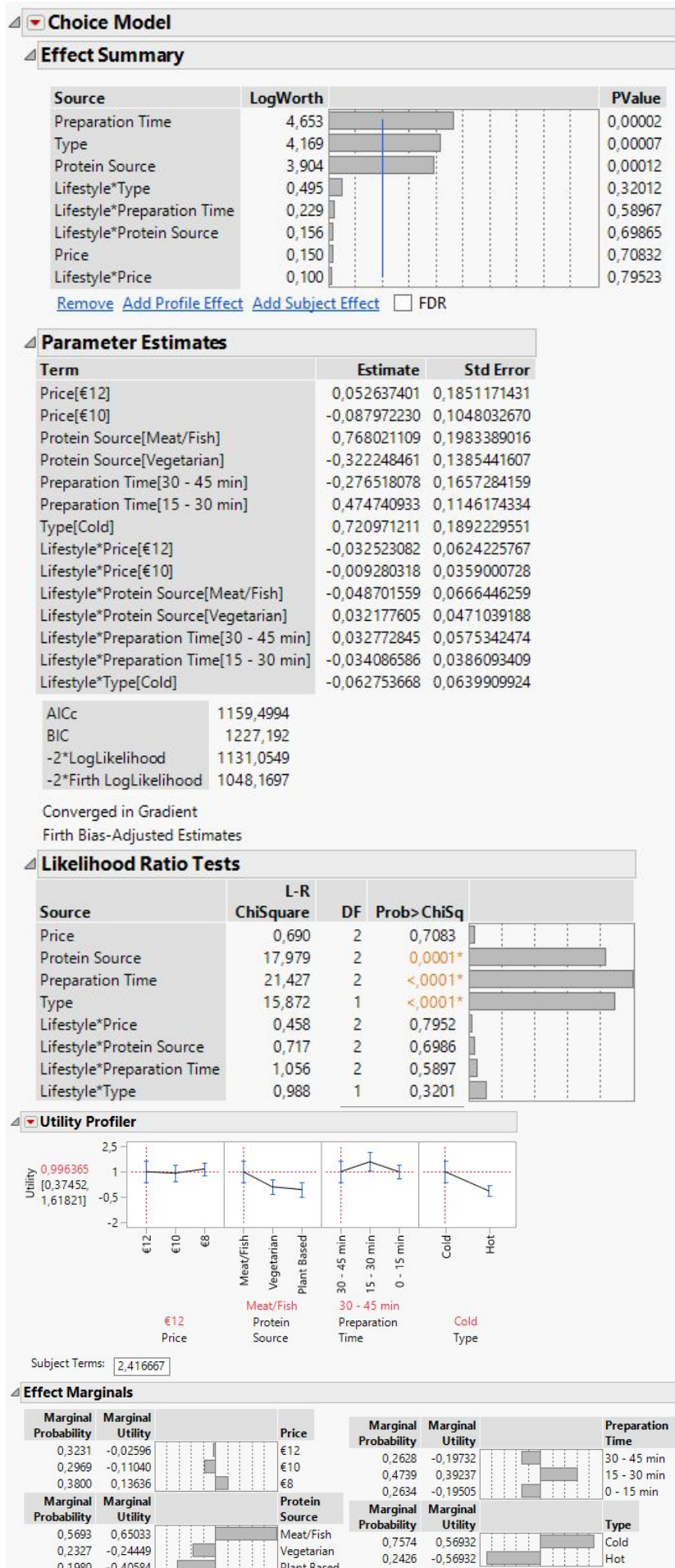


Figure 9: The generated results in JMP with 'Body' added as variable

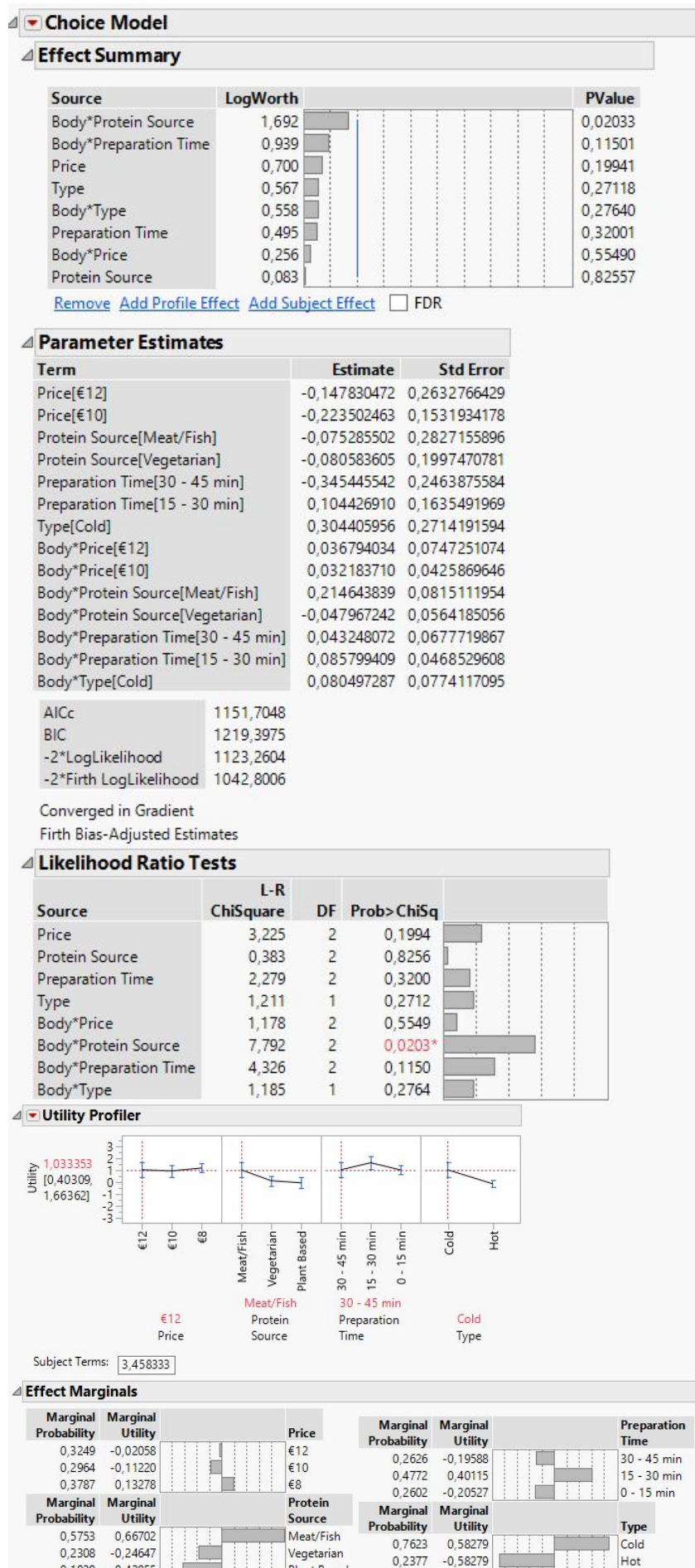


Figure 10: The generated results in JMP with 'Planet' added as variable

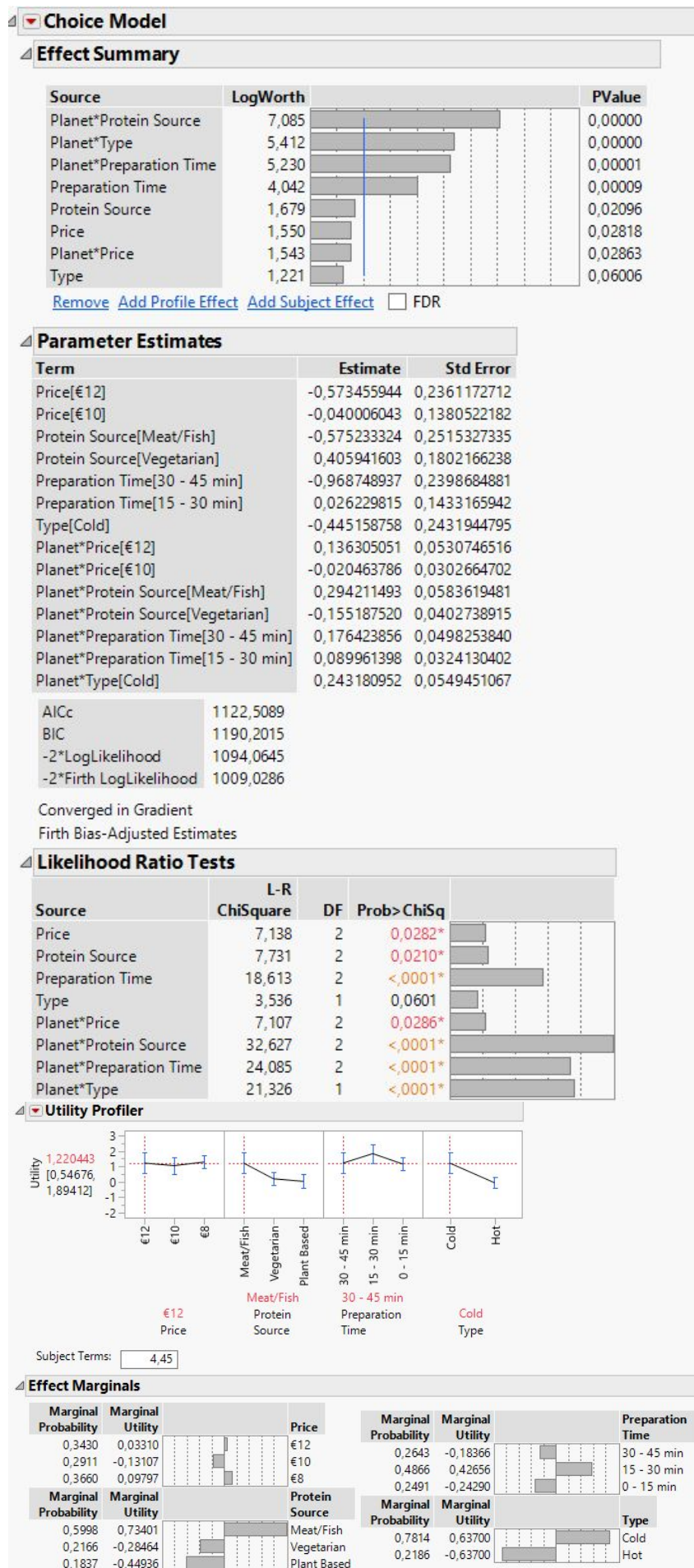


Figure 11: The utility profiler report created with JMP

Number	Price	Protein Source	Preparation Time	Type	Utility
43	€8	Vegetarian	30 - 45 min	Cold	1,749667922
38	€8	Meat/Fish	30 - 45 min	Hot	1,579607408
46	€8	Vegetarian	15 - 30 min	Hot	1,498964175
24	€10	Meat/Fish	0 - 15 min	Hot	1,163736391
42	€8	Meat/Fish	0 - 15 min	Hot	1,159522707
39	€8	Meat/Fish	15 - 30 min	Cold	0,9936758763
29	€10	Vegetarian	0 - 15 min	Cold	0,9894621926
6	€12	Meat/Fish	0 - 15 min	Hot	0,9130326435
26	€10	Vegetarian	30 - 45 min	Hot	0,9088189598
12	€12	Vegetarian	0 - 15 min	Hot	0,8564656956
22	€10	Meat/Fish	15 - 30 min	Hot	0,6964772933
19	€10	Meat/Fish	30 - 45 min	Cold	0,6864051815
1	€12	Meat/Fish	30 - 45 min	Cold	0,6124879869
30	€10	Vegetarian	0 - 15 min	Hot	0,6057619487
48	€8	Vegetarian	0 - 15 min	Hot	0,5264167792
27	€10	Vegetarian	15 - 30 min	Cold	0,4457735464
31	€10	Plant Based	30 - 45 min	Cold	0,4424274727
16	€12	Plant Based	15 - 30 min	Hot	0,3617842399
7	€12	Vegetarian	30 - 45 min	Cold	0,270534164
44	€8	Vegetarian	30 - 45 min	Hot	0,2663204803
17	€12	Plant Based	0 - 15 min	Cold	0,1105457616
10	€12	Vegetarian	15 - 30 min	Hot	0,1063320779
50	€8	Plant Based	30 - 45 min	Hot	0,1004736498
2	€12	Meat/Fish	30 - 45 min	Hot	0,0962599661
36	€10	Plant Based	0 - 15 min	Hot	0,0265564552
3	€12	Meat/Fish	15 - 30 min	Cold	0,0223427715
18	€12	Plant Based	0 - 15 min	Hot	0,019830417
11	€12	Vegetarian	0 - 15 min	Cold	0,0156167333
4	€12	Meat/Fish	15 - 30 min	Hot	-0,059514753
14	€12	Plant Based	30 - 45 min	Hot	-0,063728436
45	€8	Vegetarian	15 - 30 min	Cold	-0,140157985
23	€10	Meat/Fish	0 - 15 min	Cold	-0,143504059
53	€8	Plant Based	0 - 15 min	Cold	-0,144371669
15	€12	Plant Based	15 - 30 min	Cold	-0,147717743
37	€8	Meat/Fish	30 - 45 min	Cold	-0,224147292
35	€10	Plant Based	0 - 15 min	Cold	-0,228360975

28	€10	Vegetarian	15 - 30 min	Hot	-0,28071424
34	€10	Plant Based	15 - 30 min	Hot	-0,440702642
40	€8	Meat/Fish	15 - 30 min	Hot	-0,450774754
49	€8	Plant Based	30 - 45 min	Cold	-0,531417987
13	€12	Plant Based	30 - 45 min	Cold	-0,610763156
51	€8	Plant Based	15 - 30 min	Cold	-0,691406389
21	€10	Meat/Fish	15 - 30 min	Cold	-0,866645771
47	€8	Vegetarian	0 - 15 min	Cold	-0,870859455
41	€8	Meat/Fish	0 - 15 min	Cold	-1,026634174
5	€12	Meat/Fish	0 - 15 min	Cold	-1,030847857
9	€12	Vegetarian	15 - 30 min	Cold	-1,036706285
52	€8	Plant Based	15 - 30 min	Hot	-1,040919969
20	€10	Meat/Fish	30 - 45 min	Hot	-1,117349518
25	€10	Vegetarian	30 - 45 min	Cold	-1,121563202
33	€10	Plant Based	15 - 30 min	Cold	-1,196694688
32	€10	Plant Based	30 - 45 min	Hot	-1,200908372
54	€8	Plant Based	0 - 15 min	Hot	-1,277337921
8	€12	Vegetarian	30 - 45 min	Hot	-1,281551604