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Applying Best-Worst Scaling Methodology to Elicit Food Values for Baby Food and Adult Food

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Abstract

Previous research by Lusk and Briggeman (2009) claims that the concept of food values should have a significant explanatory power on explaining choices between a wide range of food products. However, as observed when inspecting preferences for organic food in the Norwegian Market in different food categories, it seems that the same consumer could have different preferences for product attributes within different food categories.

This study investigated food values both for adult and for baby food and made comparisons to see whether there is a reason to believe that there exists a common set of food values that guide the purchase of both. To determine relative importance consumers place on the different food values the best-worst scaling or maximum-difference method was used. The following food values were included in the food value set: naturalness, taste, price, safety, convenience, nutrition, tradition, country of origin, fairness, appearance, environmental impact and product packaging.

This research used data collected in an online survey, carried out in Spring, 2018 to investigate the food-specific values among Norwegian parents with babies in the age of 0-24 months.

Results revealed clear differences in preference rankings for food values between baby and adult food categories.

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1. Introduction

There is arguably no stronger connection in nature as the bond between a parent and their child. Parents are willing to provide consistent and loving care to their children, and during the first two years of a child´s life, baby food is a particular interest parents care about. In the first 24 months after birth, infants and toddlers consume an increasingly complex diet, moving from a largely milk-based diet to one that incorporates different solid foods (Fox, Pac, Devaney, & Jankowski, 2004). Proper nutrition and a balanced diet for the babies affect their health and development, and potentially can have a long-term effect for their life (Andrews, 2018).

Baby food is presumably the only food category in which the actual food consumer is not able to make purchasing decisions. Instead, parents are those who decide which baby food products to purchase for their babies. According to Benton (2004), parenting is a critical factor in the development of food preferences for children. For example, research shows that if parents force a child to eat a food it will decrease the liking for that food (Benton, 2004). Moreover, research reveals that there exists a concordance between mothers´ and children´s food preferences (Howard, Mallan, Byrne, Magarey, & Daniels, 2012). Thus, parents have a huge impact on their baby´s food preferences, but what actually motivates parents to choose one baby food product over another?

Sales data shows that parents are much more likely to choose organic food for their babies than for themselves. According to the Norwegian Agriculture Agency (2016), share of organic food retail sales in Norway was estimated to be around 1.8 % of total food purchases in 2016. The market share for organic baby food equaled 12 % of total organic food sales in

Norway in 2016. Moreover, 35.1 % of all baby food products available in the Norway are organic, which constitutes the largest organic market share within a particular food category across all food categories in the Norwegian Market in 2016. Considering the fact that the baby food category includes food products especially for infants and babies mainly in the age of 0-24 months, the organic market share within this category is high. Thus, it might be inferred that organic foods are in higher demand particularly within the baby food category. However, what motivates parents to have different purchasing patterns when purchasing food for their babies is unclear. Furthermore, what is driving preferences for specific food attributes? And finally, different preferences driving consumption patterns within different food categories appear to be present.

According to Brunsø, Fjord, and Grunert (2002), research into consumers´ food choice and quality perception has been a traditional research topic for many decades. Additionally, these topics have received even more attention due to ongoing debate about such issues as ethical considerations related to food production and quality, food scandals and the resulting food scares among consumers, genetic modification of foods, and animal welfare (Brunsø et al., 2002).

Agricultural economists lately have aimed their attention to estimating preferences for one food product attribute over another (Lusk & Briggeman, 2009). However, according to Lusk and Briggeman (2009), such research often focuses on measuring preferences for goods and attributes for which people do not have at all or have limited prior experience or knowledge of. That means that the estimated preferences often may be less stable than is measured by theoretical models of consumer decision-making. Besides, traditionally economists have avoided to draw a sharp distinction between values and preferences explaining individuals food choice (Lusk & Briggeman, 2009). However, values compared to preferences are defined as more stable across time and more abstract than food preferences. Food values can explain

individuals food choices across different food products and do not depend on the specific context (Bazzani, Gustavsen, Nayga, & Rickertsen, 2017). According to Lusk and Briggeman (2009) food values are identified as intermediary values in the means-end chain theory. Lusk and Briggeman (2009) tried to identify a specific set of food values or meta-preferences for which people may have more well-defined preferences, in attempt to provide some insight into why a consumer chooses one product or attribute over another.

Lusk and Briggeman (2009) in their research about food values claim that food values or meta-preferences should have "significant explanatory power in explaining choices between a wide range of food products" (Lusk & Briggeman, 2009, p. 194). However, as observed when inspecting preferences for organic food in the Norwegian Market in different food categories, it seems that the same consumer could have different preferences for product attributes within different food categories.

Steptoe, Pollard, and Wardle (1995) developed the multidimensional measure of food choice values guiding motives related to food choice. They originally developed nine food choice values. These are health (prevention of chronic disease and general nutrition and well-being), mood (alertness, mood, stress control, and relaxation), convenience (ease of purchase and preparation of food), sensory appeal (smell, taste, and appearance), natural content (use of additives and natural ingredients), price (cost), weight control (dietary restraint and preference for thinness), familiarity (foods that align with accustomed diet), and ethical concern (environmental and political issues) (Lyerly & Reeve, 2015).

However, Lyerly and Reeve (2015) suggest several factors that an updated food choice value scale may be needed. Firstly, an updated food choice value scale is necessary because the initial food value choice scale is not complete, and it must be adjusted to current political, economic and social conditions. For instance, the research of Lusk and Briggeman (2009) identified safety and fairness as additional food choice values. Moreover, Sobal and Bisogni

(2009) acknowledges that food choice decisions are dynamic, thus changing over time. Thus, Lyerly and Reeve (2015) in their recent study developed a new and updated food choice value scale consisting of eight empirically defined values: accessibility, convenience, health/weight control, tradition, sensory appeal, organic, comfort and safety.

Much of the recent literature has focused on concepts as consumer preferences, values and perceptions towards food. However, to my knowledge no research has focused specifically on the baby food market. Also, to the best of our knowledge, this might be a first attempt at measuring peoples' values within specific food categories.

This research used data collected in an online survey, carried out in Spring, 2018 to investigate the food-specific values among Norwegian parents with babies in the age of 0-24 months. The survey is included in the appendix.

This study investigated food values both for adult and for baby food and made comparisons to see whether there is a reason to believe that a common set of food values that guide the purchase of both exists. More specifically this research aims to answer the following RESEARCH QUESTIONS:

1) ***RQ1: How important are various food-specific values when purchasing food for babies?***
2) ***RQ2: How important are various food-specific values when purchasing food for adults?***
3) ***RQ3: Is the ranking of food values the same when purchasing food for adults and for babies?***

2. Theory of Analyzing Consumer Food Choice

Consumer food choice studies investigates consumer motivation behind food selection. Consumer food choice is commonly defined as a complex function of preferences for sensory characteristics as taste, smell and texture, combined with non-sensory factors, including food-related expectations and attitudes, health claims, price, ethical concerns and mood (Prescott, Young, O'neill, Yau, & Stevens, 2002). Initial research of food choices proposed that "several specific frames of relevance" are involved in food choice, among them: health, social status and price (Furst, Connors, Bisogni, Sobal, & Falk, 1996).

Later research investigated aforesaid and other values, focusing on cognitive and motivational factors involved in food choice (Furst et al., 1996). Several approaches have been developed to analyze motives driving consumer food choice. Some of the approaches are: Total food quality model (Grunert, Larsen, Madsen, & Baadsgaard, 1996), Means-end chain theory (Gutman, 1982) and Food choice process model and the concept of food values (Furst et al., 1996). Further in this study I will briefly introduce some of the theories and methods of analyzing consumer food choice. Finally, I will focus on the concept of food values.

2.1 The Total Food Quality Model

The Total Food Quality model is originally proposed by Grunert et al. (1996). This model provides an integrative framework for analyzing consumer food choice and quality perception (Grunert, 2002). This approach incorporates a number of other theories and

approaches such as means-end chain theory, multi-attribute theory, economics information approach, and the philosophy related to the explanation of motivation behind purchasing decisions and consumer satisfaction (de Carlos, García, de Felipe, Briz, & Morais, 2005).

According to Grunert (2005), the model consists of two major dimensions: vertical and horizontal, along which it is possible to analyze food quality perception. Initially, model distinguishes between "before" and "after" purchase judgements which forms the basis of the Total Food Quality Model and incorporates horizontal model dimension (Brunsø et al., 2002).

Secondly, the vertical dimension deals with inference-making using specific market signals or cues (Grunert, 2005). Additionally, vertical dimension of the model deals with the questions of how consumers detect which properties of a food product are attractive by linking them to basic motivators of human behavior (Grunert, 2005). Thus, the vertical dimension integrates the means-end approach to the analysis of quality and quality perception research based on the concept of quality cues (Grunert, 2005). I will explain the theory of the means-end chain in the following section.

Finally, the Total Food Quality model allows to reveal the relationship between quality expectations formed "before" purchase and quality experience gained "after" purchase which is commonly believed to determine product satisfaction, and the probability of purchasing the product again (Brunsø et al., 2002).

2.1 Means-end Chain Theory

Means-end approach provides a concept to analyze consumer food choices. "A means-end chain is a knowledge structure that links consumers´ knowledge about product attributes with their personal knowledge about consequences and values (Zanoli & Naspetti, 2002, p. 3). Thus, means-end chains represents the links, which a consumer establishes by associations

between product attributes and more abstract categories such as values, which can motivate behavior and create interest for product attributes (Brunsø et al., 2002). For example, milk product attribute- "light" is linked to consequences of consumption- "having a slim figure", which may lead to the important life values as, for instance "higher self-esteem" (Brunsø et al., 2002).

In the most general means-end formulation consumers have three levels of product-related knowledge: product attributes, the consequences or outcomes of using a product, and the broad goals or values that may be satisfied by use of that product (Figure 1) (Olson & Reynolds, 2001). According to Olson and Reynolds (2001), this set of associations is called means-end chain because consumers see the product and its attributes as means to an end (satisfaction). The chain, as noted before, is the set of linkages between attributes, consequences and values. Since the means-end chain model allows to explicitly link consumers' needs and products characteristics, thus revealing consumer motivations in purchasing product (Zanoli & Naspetti, 2002).

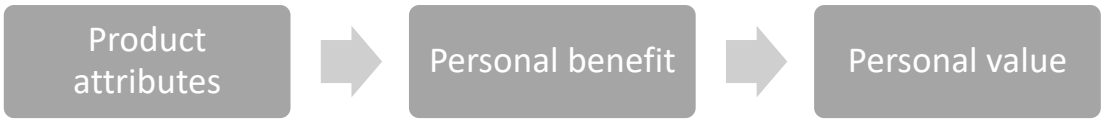

Figure 1. The simplest means-end chain model

As stated by Lusk and Briggeman (2009), means-end chain theory includes the laddering approach where consumers are shown a variety of competing products and asked to identify why they might select one product over another. Typically, as an answer to this kind of question, consumers state different product attributes. After that consumers are asked to state more abstract reasons for why an attribute is important to them, until they respond with a terminal value or until no more abstract reasons or end states of existence could not be stated (Lusk & Briggeman, 2009). For example, the study of Kirchhoff, Smyth, Sanderson,

Sultanbawa, and Gething (2011) about vegetable consumption, developed following means-end chain. Initially the product attributes respondents associated with vegetables were "freshness" and a "source of vitamins", further these features were linked to the personal benefit concept as "maintain energy and vitality" and later to "maintain an active life". Finally, the respondents stated personal values as "enjoy life" and "achieve goals" as the end-states or goals (Kirchhoff et al., 2011).

2.3 Food Choice Process Model

Recently researchers have increasingly adopted the concept of food choice values defined as "factors that individuals consider when deciding which foods to purchase and/or consume" (Lyerly & Reeve, 2015, p. 47). This concept is largely based on the Food Choice Process model (Furst et al., 1996). This model allows to explain the complex task of making food choices (Connors, Bisogni, Sobal, & Devine, 2001).

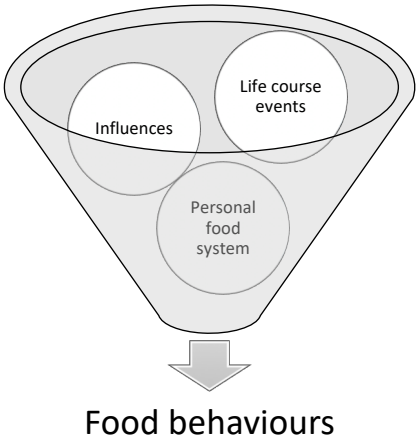

Figure 2. The Food Choice Process model

Figure 2 demonstrates the structure of the Food Choice Process model. According to the structure of the model, food behavior is based on life course events and experiences along with five types of influences: ideals, personal factors, resources, social factors, and contexts

and personal food system (Preedy, Watson, & Martin, 2011). The personal food system is a concept representing the processes constructed by individuals to make food choices (Connors et al., 2001). As explained by Preedy et al. (2011) "the personal food system represents the many cognitive processes trough which a person translates life course experiences and the influences into food behaviors", moreover, the personal food system includes construction of food choice values, negotiation of values, classification of foods, and development of strategies to achieve food choice values.

Thus, people use different distinctive considerations as a basis for food choice which are labeled as values (Connors et al., 2001). Thus, the most frequently considered food related values are health (physical well-being), taste (sensory perceptions), cost (monetary considerations), convenience (time and effort), and managing relationships (interpersonal interactions) (Connors et al., 2001). However, other research has identified other conceptual elements similar to values that also guide food-choice behavior (Connors et al., 2001).

2.4 The Concept of Food Values

Several value classification systems have been developed. Most notable value classification systems are developed by Rokeach (1973) and more recently by Schwartz (1992). According to definitions proposed by social psychologist Rokeach (1973), value is "an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence" and a value system is "an enduring organization of beliefs concerning preferable modes of conduct or end-states of existence along a continuum of relative importance" (Lusk & Briggeman, 2009, p. 185). He proposed two sets of values- eighteen terminal values (e.g. a world at peace, family security, self-respect, happiness, etc.) and instrumental values (e.g. ambitious, intellectual, cheerful, etc.) (Rokeach, 1973). On the other hand, research conducted by Schwartz (1992) has

developed other value classification systems, classifying values into the following categories: achievement, benevolence, conformity, hedonism, power, security, self-direction, stimulation, tradition, and universalism.

Another consumers´ food value system is developed by Lusk and Briggeman (2009) who compiled a list of food values on the basis of previous literature related to human values and food preferences. Food value list composed by the researchers consists of eleven food values: naturalness, taste, price, safety, convenience, nutrition, tradition, origin, fairness, appearance and environmental impact.

In the research of Lusk and Briggeman (2009) authors assured that ”individuals´ food choices may be explained by their preferences for more abstract food quality attributes” (Lusk & Briggeman, 2009, p. 186). Lusk and Briggeman (2009) define these more abstract food quality attributes as food values which ought to be relatively stable across time and are potentially applicable in explaining choices between wide range of different food products.

3. Methodology and Experimental Design

3.1 Research Design

This was a descriptive research which employed quantitative method of data collection. The main aim of this research was eliciting and comparing food-specific value systems between two different food categories: baby food and adult food. This study used best-worst scaling method to determine relative importance consumers place on the different food values.

Data were collected through the online survey. The defined population criteria of the survey were parents with babies in the age of 0-24 months. Collected data were estimated using MNL model and the RPL model by conditional (fixed-effects) logistic regression and mixed logit model within STATA software.

Finally, it is worthy to mention that this research was not in collaboration with any institution, the choice of appropriate method was highly limited due to the time and budget constraint.

3.1.1 Data Collection Tools (Survey)

The data were collected through an online survey in Norway, conducted between the 22nd of February and the 1st of March 2018. Respondents were invited to participate in the online survey via the Facebook social networking website. Invitation to participate in an online

survey was posted into the five biggest Facebook social networking groups for parents in Norway.

Before executing a larger scale survey, I conducted a pilot survey between 15th and 20th of February. The main purpose of the pilot survey was to verify and test the questionnaire to improve the main survey. Final corrections and improvements to the main survey were based on the feedback from the respondents of the pilot survey. Data for both the pilot and the main surveys[1] were collected using online survey software Survey Monkey.

Respondents were recruited in the following social networking groups: Barnegruppe-spørsmål og svar (more than 11 000 members), Foreldre for foreldre (more than 11 000 members), Oss med barn og dem som venter barn (more than 3000 members), Hjemmelaget babymat 0-2 år (more than 500 members) and Baby og barn (more than 2000 members).

Only respondents with babies at the age of 0-24 months living in the household were invited to participate in the survey. Respondents were asked to evaluate the aspects they consider most and least important when buying baby food products and food products for their own consumption, as well as revealed preference questions regarding organic food. The survey consisted of four main parts: (i) economic and socio-demographic questions; (ii) best-worst scaling method questions about food values regarding baby food; (iii) best-worst scaling method questions about food values regarding food for the respondent (adult food); (iv) revealed preference questions for organic food.

[1] The main survey questionnaire is included in the appendix in Norwegian

3.1.2 Sampling and the Sample

Overall 90 people answered the online survey. However, according to defined population criteria (parents with babies in the age of 0-24 months living in the household), only 80 of them were qualified for sample inclusion.

Economic and socio-demographic questions contained gender, education, region of residence, households' income, size and structure of the household, and questions about baby and other children living in the household. Table 1 provides summary statistics of the respondents.

Table 1. Characteristics of Survey Respondents

Variable	Definition	Mean	Standard Deviation
Gender	1 if female	0.96	0.19
Education	1 if elementary School 2 if secondary School 3 if college 4 if bachelor's degree 5 if master's degree 6 if higher than master's degree	3.67	1.21
Annual Households income	1 if NOK 0 – NOK 200 000 2 if NOK 201 000 – NOK 400 000 3 if NOK 401 000 – NOK 600 000 4 if NOK 601 000 – NOK 800 000 5 if NOK 801 000 – NOK 1000 000 6 if NOK 1001 000 – NOK 1200 000 7 if NOK 1202 000 and more	4.28	1.62
Household Structure:			
Number of adults	Number of adults (over 18 years old) living in the household	2.39	0.81
Number of children	Number of children (2-17 years old) living in the household	1.14	0.98
Number of babies	Number of babies (0-24 months old) living in the household	0.85	0.42
Age of the baby	1 if age of the baby 0-3 months 2 if age of the baby 4-7 months 3 if age of the baby 8-11 months 4 if age of the baby 12-24 months	3.00	0.98

(continued)

Region of residence:			
Oslo	1 if region of residence Oslo	0.04	0.19
Viken	1 if region of residence Viken (Akershus, Buskerud and Østfold)	0.30	0.46
Innlandet	1 if region of residence Innlandet (Hedmark, Oppland)	0.11	0.32
Telemark-Vestfold	1 if region of residence Telemark-Vestfold	0.02	0.14
Agder	1 if region of residence Agder (Aust- and Vest-Agder)	0.06	0.23
Rogaland	1 if region of residence Rogaland	0.04	0.19
Vestlandet	1 if region of residence Vestlandet (Hordaland, Sogn and Fjordane)	0.19	0.39
Møre og Romsdal	1 if region of residence Møre og Romsdal	0.02	0.14
Trøndelag	1 if region of residence Trøndelag (Sør- and Nord- Trøndelag)	0.11	0.32
Nordland	1 if region of residence Nordland	0.06	0.23
Nord-Hålogaland	1 if region of residence Nord- Hålogaland (Troms, Finnmark)	0.06	0.23

Most of the respondents were female (96 %) which is understandable considering that generally women tend to stay home with their babies during children first year of life (Statistics Norway, 2012). Quarter of the respondents had the secondary school diploma (25 %) and almost half- bachelor's degree (40 %). Average total gross income of the household in the year 2017 was between NOK 601 000 and NOK 800 000. While 24 % of the respondents indicated households' income to be between NOK 401 000 – NOK 600 000 and 21 % between NOK 1001 000 and NOK 1200 000. Results showed that on average number of adults (over 18 years old) living in the household was 2 (mean 2.39), while number of children (2-17 years old) (mean 1.14) and number of babies (0-24 months) (mean 0.85) were 1. 40 % of the babies living in the household were between 12 and 24 months old, while only 7 % of the respondents indicated that their baby is between 0 and 3 months old. One third of the respondents who participated in the survey were from the Viken region (30 %) which is the region with the largest population.

3.1.3 Food Value Set in the Survey

I follow the research of Lusk and Briggeman (2009) to determine consumers´ food-specific value systems among consumers in the Norwegian food market towards both adult and baby food. As explained in the Chapter 2, they specified 11 food values: naturalness, safety, environmental impact, origin, fairness, nutrition, taste, appearance, convenience, price and tradition.

Food value set in this study consisted of 13 credence, search and experience attributes. Naturalness, safety, nutrition, country of origin, fairness, environmental impact, animal welfare, tradition and product packaging values are considered as credence attributes. While taste, convenience, and appearance are experience attributes. Finally, price is the search attribute and determines the price that is paid for the baby food/adult food.

The food value set in this study differed from the food value set specified by Lusk and Briggeman (2009) in several ways: (i) the food value set in this study consisted of 13 food values (two additional food values were added to the food value set); (ii) there was a distinction between two food value sets: when purchasing baby food and when purchasing food for own consumption; (iii) the food value definitions were slightly modified to adjust for respondents in Norway. Comparison of food values with definitions across study of Lusk and Briggeman (2009) and the particular study are displayed in the Table 2. Presumably the values shown in Table 2 and used in this research are reasonably exhaustive in covering the breadth of issues or values motivating consumer food choice.

Table 2. Food values and descriptions

Lusk and Briggeman (2009)	**This study**
Naturalness (extent to which food is produced without modern technologies)	*Naturalness* (extent to which baby food/food is produced without use of synthetic fertilizers, pesticides, hormones, genetically modified organisms and irradiation)
Taste (extent to which consumption of food is appealing to the senses)	*Taste* (extent to which consumption of the baby food/food is appealing to the smelling, tasting to your baby/ to you)
Price (the price that is paid for the food)	*Price* (the price that is paid for the baby food/food)
Safety (extent to which consumption of food will not cause illness)	*Safety* (extent to which the consumption of baby food/food will not cause any health problems to your baby/ to you in the long run)
Convenience (ease with which food is cooked and/or consumed)	*Convenience* (ease with which baby food/food is cooked and/or consumed)
Nutrition (amount and type of fat, protein vitamins, etc.)	*Nutrition* (amount and type of fat, protein, vitamins, etc)
Tradition (preserving traditional consumption patterns)	*Tradition* (preserving traditional consumption patterns in your culture)
Origin (where the agricultural commodities were grown)	*Country of origin* (country where the product comes from)
Fairness (the extent to which all parties involved in the production of the food equally benefit)	*Fairness* (the extent to which all parties involved in the production of the food equally benefit)
Appearance (extent to which food looks appealing)	*Appearance* (extent to which baby food/food look appealing)
Environmental Impact (effect of food production on the environment)	*Environmental Impact* (effect of baby food/food production on the environment)
	Animal Welfare (effect of baby food/food production on the animal welfare)
	Product Packaging (the extent to which product packaging is produced in sustainable manner)

As noted before, initial food value definitions produced in the research of Lusk and Briggeman (2009) were slightly modified to adjust for respondents in Norway and for specific food preference cases studied in this research (baby food vs adult food). For instance, the definition of naturalness which initially was defined as "extent to which food is produced

without modern technologies" was modified to provide a more concrete explanation of naturalness, namely "extent to which baby food/food is produced without use of synthetic fertilizers, pesticides, hormones, genetically modified organisms and irradiation". In addition, food value definitions for taste, safety, tradition and country of origin were slightly adjusted. Finally, all the definitions in this study pointed out and distinguished specific food category ("baby food" and "food" for adult food category).

To be able to compare and find the difference between motivations driving baby food purchase vs motivations driving food purchase for adults, two distinct food value sets were composed. First, food value set considering baby food and second food value set considering food for own consumption. Both food value sets consisted of identical 13 food values, however definitions of the food values were slightly adapted to each case separately. However, mainly the main difference between definitions between baby and adult food categories was due to clarification of specific food category in the definition of food value (baby food/food).

Additionally, food value set developed by Lusk and Briggeman (2009), two extra food values were added- animal welfare and product packaging. Based on the recent literature, consumers are increasingly interested in sustainable consumption and environmental issues related to sustainably produced food which can influence consumers´ decision making (Aprile, Caputo, & Nayga Jr, 2012). Moreover, environmental or green behavior has expanded to cover issues of animal welfare, human rights, country of origin, fair trade, anti-globalization and other related issues (Dowd & Burke, 2013). Also as noted in the previous research about food values in Norway by Bazzani et al. (2017), Norwegian consumers rank animal welfare as very important.

3.3 Best-worst Scaling Method

I used the best-worst scaling or maximum-difference method to determine relative importance consumers place on the different food values. This method was first published by Finn and Louviere (1992) in place of category rating scales (Flynn & Marley, 2014). The best-worst scaling method is an extension of the paired comparison method developed by Thurstone (1927) where individual must indicate the best between two choice alternatives (Bazzani et al., 2017). The best-worst scaling method consists of a series of choice sets where respondents are asked to choose attributes they prefer the most (or consider the most important) and which they prefer the least (consider the least important) (Bazzani et al., 2017; Flynn & Marley, 2014).

According to Bazzani et al. (2017), best-worst scaling method has a several advantages over a common rating-based methods: (i) respondents must choose only the most and the least preferred choice alternative; (ii) there is no possibility to have an equal value to all the choice alternatives; (iii) researchers can create individual-level scales of importance for each choice alternative ad compare them.

There exists three possible cases or response mechanisms of the method: (i) the object case, (ii) the profile case, and (iii) the multi-profile case (Flynn & Marley, 2014). Bazzani et al. (2017) articulated each case as follows: in Case 1, the respondents are asked to indicate the most and the least important alternative from the choice set; in Case 2, the respondents are asked to choose among a list of associated attributes and attribute levels because choice alternatives are not present as a whole; finally, in Case 3, respondents are asked to choose the best and the worst choice alternatives which are described by a number of attributes and attribute levels. In this study, I use Case 1 since I am interested in the relative values associated with the list of food values.

Case 1 is the "classic" case of best-worst scaling that was developed by Louviere in the end of 1980s (Louviere, Flynn, & Marley, 2015). As explained by Louviere et al. (2015), in

this case the researcher is interested in measuring a set of items or objects on an underlying, latent, subjective scale. Thus, this case requires a list of items to measure. In this study, the list of items consists of 13 food values.

Once the researcher has chosen the list of items to include in the choice experiment, it is necessary to allocate the different items across the choice sets. Commonly used statistical designs which corresponds to the Case 1 are 2^J designs, Balanced Incomplete Block Designs (BIBDs) and random design (Flynn & Marley, 2014). In 2^J designs *J* objects are allocated into 2^J distinct choice sets with varied number of items in each choice set (Flynn & Marley, 2014). While in BIBDs design occurrence and co-occurrences of items is constant, thus each item is present in the choice sets equal number of times and each item is repeated the same number of times across the choice sets (Bazzani et al., 2017; Flynn & Marley, 2014). Finally, random design uses random integers to allocate items in the choice sets imposing necessary allocation restrictions.

To allocate the different food values into choice sets in this study, I created random statistical design by generating random integer between 0 and 1000 and allocating food values to different choice sets and (sub)sets based on the integer generated. In total five question groups were created. One question group consisted of two choice sets for the baby food and 2 choice sets for the adult food. Moreover, each choice set consisted of all 13 food values.

In this manner, statistical design in this study consisted of 20 different choice sets, with each of the choice sets containing three sub-sets of four or five food values. One choice set consisted of all thirteen food values allocated into three sub-sets or questions and each item was present in the choice set one time. It is worthy to mention that 10 choice sets were devoted to best-worst questions regarding baby food and 10 choice sets for best-worst questions regarding adult food. An example of the choice sub-set or question is reported in the Figure 3.

Which of the following issues is most important and which is least important when you purchase food for your baby?

Please mark the most important issue with 1 and the least important issue with 4.

□ **Safety** (extent to which the consumption of food will not cause any health problems to your baby in the long run);

□ **Nutrition** (amount and type of fat, protein, vitamins, etc);

□ **Taste** (extent to which consumption of the food is appealing to the smelling, tasting to your baby);

□ **Price** (the price that is paid for the baby food);

Figure 3. Example of best-worst question with 4 food value items

Respondents were randomly allocated into one of the five different question groups. The resulting design for each respondent consisted of four choice sets or twelve choice sub-sets: six choice sub-sets regarding baby food values and six choice sub-sets regarding adult food values. Each respondent answered twelve best-worst questions in total. Firstly, in each choice sub-sets respondents were asked to indicate which one among the four or five food values they considered as most important and which one they considered as the least important when purchasing baby food products to their 0-24 months old babies. Then, respondents were asked to indicate which one among the four or five food values they considered as most important and which one they considered as the least important when purchasing food to their own consumption. It was possible to value only one item as the best and only one item as the worst in each choice sub-sets or question.

3.4 Revealed Preference Questions for Organic Food

To see the extent to which differences in food values explain differences in preferences for organic food, the survey contained revealed preference questions. Before asking questions about organic food, respondents were introduced with a definition of organic food and short

description of Norwegian organic label Debio, in case people were unaware of the meaning of organic food. Further, respondents were asked a revealed preference question about whether they had purchased organic food to their baby in the last month. Response categories consisted of four answer choices: “yes”, “no”, “I don’t know” and “other” where respondents could add comments if none of above mentioned answer choices in their opinion did not correspond to their behavior. In addition, respondents were asked to define the overall proportion of organic food in their baby’s diet in the last month. It was mentioned that breast milk does not count as an organic. The respondents were asked to indicate amount of organic food consumed in the last month, where 0% answer meant that baby ate only conventionally produced food while 100% answer represented that the baby’s diet contained only organic baby food in the last month.

Second question group was devoted to eliciting revealed preferences towards organic food among respondents themselves. Respondents were asked similar revealed preference questions as before. Firstly, whether they had purchased organic food to their own consumption in the last month and secondly, respondents had to define the overall proportion of organic food in their own diet.

3.5 Econometric Analysis

Best-worst scaling is as a discrete choice experiment. Discrete choice experiments are based on Random Utility Theory (RUT) which provides an explanation of the choice behavior of humans (Louviere, Flynn, & Carson, 2010). “RUT assumes that people make errors, but when choosing repeatedly their choice frequencies give an indication of how much they value items under consideration” (Louviere et al., 2015, p. 7). Thus, the number of times item A is picked over item B provides an evidence of how much item A is preferred to item B (Louviere et al., 2015).

According to RUT each person has a latent utility for each choice alternative (Louviere et al., 2010). Latent utility consists of two components, a systematic or explainable component and random or unexplainable component (Louviere et al., 2010). Thus, the basic axiom of RUT can be defined as:

$$U_{in} = V_{in} + \varepsilon_{in} \quad (1)$$

where U_{in} is the latent utility that individual *n* associates with choice alternative *i*, V_{in} is the systematic, explainable component of latent utility that an individual *n* associates with choice alternative *i* and ε_{in} is the random component associated with individual *n* and choice alternative *i* and is assumed to be independent of V_{in}. Thus, researchers can predict the probability that individual *n* will choose an alternative *i* from the choice alternative set based on the utility concept.

"Generally, when respondents are presented with the choice set, they make choices on the basis of the maximization of the utility they can derive from each alternative of the presented choice set" (Bazzani et al., 2017, p. 12). Thus, choosing between alternative *j* and alternative *k* in the choice set z, respondent *n* will choose alternative *i* as the best and alternative *k* as the worst when:

$$U_{inz} > U_{knz} \quad \text{for all i} \neq \text{k} \quad (2)$$

According to Lusk and Briggeman (2009), respondents answering each best-worst question can be conceptualized as choosing the two alternatives that maximize the difference between two alternatives on an underlying scale of importance. Thus, as noted in Bazzani et al. (2017) respondent *n* chooses the pair of alternatives *i* and *k* as the best and worst, respectively, when

$$U_{inz} - U_{knz} > U_{jnz} - U_{mnz} \text{ for all i} \neq \text{j and k} \neq \text{m} \quad (3)$$

Particular pair of best and worst alternatives chosen by the respondent, represents a choice out of all J(J-1) possible pairs that maximizes the difference of importance, where J is

the number of alternatives included on the choice set (Lusk & Briggeman, 2009). As noted before, in this study a choice (sub)set represents one best-worst question for the respondent and includes 4 or 5 food values in each.

Thus, following the work of Lusk and Briggeman (2009), I define λ_i as the explainable component or location of value *i* on the underlying scale of importance of the unobserved level of importance of food value *i* for respondent *n*, I_{ni} , is given by:

$$I_{ni} = \lambda_i + \varepsilon_{ni} \tag{4}$$

where ε_{ni} is the random error term. Thereby, the probability that the respondent *n* chooses, for instance, choice alternative *i* as the best and alternative *k* as the worst, out of a choice set with J alternatives, is the probability that the difference in I_{ni} and I_{nk} is greater than all other J(J-1)-1 possible differences in the choice set (Lusk & Briggeman, 2009).

Data which are obtained from best-worst scaling experiment can be analyzed using extension to maximum-likelihood based methods which are commonly used in discrete choice experiments or the approach of the best-minus-worst scores (Flynn & Marley, 2014). To analyze data in this study I will use maximum-likelihood and simulated likelihood based methods.

To be more precise, initially, the extension to multinomial logit (MNL) model- a conditional multinomial logit (CL) model will be used. McFadden (1973) showed that CL model is consistent with RUT and applied this model to choice behavior that was consistent with economic theory (Hauber et al., 2016). According to Hauber et al. (2016) both MNL and CL models rely on the same statistical assumptions about the relationship between variables, thus the terms MNL and CL are used interchangeably in the literature.

Using a MNL model, the probability of respondent *n* choosing *i* and *k* alternatives as the best and worst among pairs of alternatives J(J-1) equals:

$$P_{nik} = \frac{e^{\lambda_i - \lambda_k}}{\sum_{l=1}^{J} \sum_{m=1}^{J} e^{\lambda_l - \lambda_m}} \tag{5}$$

where the choice of respondent *n* takes the value 1 for the pair of alternatives chosen by the respondent as the best and the worst, and value of 0 for remaining J(J-1)-1 pairs of alternatives (Bazzani et al., 2017; Lusk & Briggeman, 2009). So, the value of λ_i represents the relative importance of food value *i* over one of the values, which is normalized to 0 to avoid "dummy variable trap" (Bazzani et al., 2017; Lusk & Briggeman, 2009).

The MNL assumes that the error terms are independently and identically distributed (IID) and implies independence within the alternatives (IIA) and taste homogeneity over respondents (Bazzani et al., 2017). However, it is very unlikely that all the respondents place the same level of importance on each value. It may be inferred that the MNL model has two fundamental limitations: scale heterogeneity and preference heterogeneity (Hauber et al., 2016). To account for MNL inability to account for correlation among multiple responses from each respondent or heterogeneity in preferences across sample (Hauber et al., 2016), random parameters logit model (RPL) also called "mixed-logit" model can be used to imply heterogeneity in respondents' food values.

RPL model is a discrete choice model which allows for random taste variations, unrestricted substitution patterns, and correlation in unobserved factors over time (Train, 2009). In the RPL model a change in one alternative will not have a proportional effect on the choice probabilities of other alternatives, model allow heteroscedastic and freely correlated error term (Alfnes, 2004). Hence, this estimator is based on the simulated likelihood allowing researchers to relax the otherwise rigid restrictions of the MNL estimator (Cicia, Del Giudice, & Scarpa, 2002). So, the importance parameter of value *i* for individual *n* is assumed to be different for each person and was specified as follows:

$$\widetilde{\lambda_{ni}} = \overline{\lambda_i} + \sigma_i \mu_{ni} \tag{6}$$

where $\overline{\lambda_i}$ and σ_i are mean and standard deviation of λ_i in the population and μ_{ni} is a normally distributed random error term with mean zero and unit standard deviation (Bazzani et al., 2017;

Lusk & Briggeman, 2009). Hence, unlike MNL that estimates only a set of coefficients capturing the mean preference weights, RPL yields both a mean effect and a standard deviation of effects across the sample (Hauber et al., 2016). This implies that the importance of the food value i is assumed to be normally distributed with mean $\overline{\lambda_i}$ and standard deviation σ_i. Substituting equation (6) into equation (5) yields a probability statement that depends on the random term μ_{ni} which is estimated by maximizing a simulated likelihood function (Bazzani et al., 2017; Lusk & Briggeman, 2009). In this study I use 1000 Halton draws for the simulation of μ_{ni} in such way taking into consideration the fact that each person answered twelve best-worst questions regarding baby food and twelve best-worst questions regarding adult food.

In the standard RPL model, it is assumed that taste parameters are independent, however, food values are expected to be related to each other (Bazzani et al., 2017). To allow for interdependency, the correlation structure of the "attribute parameters was assumed to follow a multivariate normal distribution" (Bazzani et al., 2017, p. 13).

According to Bazzani et al. (2017), the estimates from the RPL model might be difficult to interpret because the random error term might vary across respondents, because the mean of the parameter estimates of λ_i may be confused with differences in scale. Hence, following the study of Lusk and Briggeman (2009), I calculated the "share of preference", *Si*, for each food value, which corresponds to the forecasted probability that each food value is picked as most important, so share of preferences for value *i*:

$$S_i = \frac{e^{\widehat{\lambda_i}}}{\sum_{k=1}^{J} e^{\widehat{\lambda_l}}}$$

which reports the importance of the value *i* on the ratio scale. Thus, if the food value i has a share value twice that of other value, it can be inferred that the value I is twice as important as other value. All shares of preferences for all food values must sum to one.

4.Statistical Analysis of the Results

4.1 Model Estimates

In this section I describe the estimated results. I estimated the MNL model and the RPL model by using conditional (fixed-effects) logistic regression and mixed logit model within STATA software.

Estimation of models required the origin or base category since importance of other food values is estimated relative to one of these food values. I used as the base category the food value, which was selected as best or worst the least number of times. In this study the base category for both food value sets was product packaging. The estimates of mean, standard errors and standard deviations estimated by the MNL and RPL models, separately for baby food and adult food are presented in the Table 3.

As shown in Table 3, I obtained a better fit with the RPL than the MNL model in both food categories as can be inferred by the increase in the log-likelihood values. In addition, I also calculated values for Bayesian (BIC) and Akaike (AIC) information criterions which can be used for the selection and comparison of the econometric models. Commonly, the model with the lowest values of AIC and BIC is preferred over the model with higher values of AIC and BIC. According to information in the case of baby food, the RPL model provided a better fit than the MNL model. In the case of adult food, value of BIC was lower for the estimated MNL model. It seemed that the additional 13 parameters in the RPL model for adult food was

not improving model as much as one could expect. However, I used estimated RPL model for both adult and baby food categories.

Results revealed that when purchasing baby food parents valued safety, nutrition, taste and fairness as the most important. While taste, nutrition, environmental impact and naturalness is valued as the most important when purchasing adult food. Food values as environmental impact, appearance, tradition and naturalness were the least important values compared to base category when purchasing baby food, in contrast to convenience, tradition, country of origin and product packaging for adult food. However, some of the parameter estimates appeared to be not statistically significant at the 5 % significance level.

Table 3. Estimates from MNL and RPL models

Food value		**MNL**		**RPL**	
		Baby food	**Adult food**	**Baby food**	**Adult food**
Safety	Mean	0.539*	0.780*	0.580	0.808*
		(0.242)	(0.282)	(0.321)	(0.365)
	Std.dev.			1.184*	1.094*
				(0.315)	(0.389)
Nutrition	Mean	0.426	1.110*	0.566	1.228*
		(0.234)	(0.281)	(0.319)	(0.409)
	Std.dev.			-1.227*	1.629*
				(0.356)	0.402)
Taste	Mean	0.513*	1.264*	0.552*	1.503*
		0.240	(0.280)	(0.272)	(0.365)
	Std.dev.			0.018	1.036*
				(0.338)	(0.395)
Price	Mean	-1.111	0.909*	-0.103	0.961*
		(0.253)	(0.272)	(0.320)	(0.346)
	Std.dev.			1.042*	1.089*
				(0.340)	(0.366)
Naturalness	Mean	-0.909*	0.886*	-1.119*	0.979*
		(0.242)	(0.267)	(0.328)	(0.364)
	Std.dev.			1.202*	1.224*
				(0.336)	(0.351)
Convenience	Mean	0.114	0.535*	0.084	0.714*
		0.234	(0.261)	(0.283)	(0.341)
	Std.dev.			0.820*	1.119*
				(0.329)	(0.340)

(continued)

Appearance	Mean	-0.609*	0.776*	-0.772*	0.859*
		(0.238)	(0.256)	(0.296)	(0.310)
	Std.dev			0.942	-0.859*
				(0.322)	(0.383)
Environmental impact	Mean	-0.570*	1.020*	-0.700*	1.098*
		(0,251)	(0.252)	(0.299)	(0.330)
	Std.dev.			0.624)	1.164*
				(0.363	(0.378)
Fairness	Mean	0.439	0.728*	0.548	0.902*
		(0,234)	(0.262)	(0.333)	(0.315)
	Std.dev.			1.496*	0.778*
				(0.350)	(0.384)
Tradition	Mean	-0.688*	0.566*	-0.809*	0.691*
		(0,227)	(0.281)	(0.299)	(0.353)
	Std.dev.			-1.148*	0.991*
				(0.333)	(0.389)
Country of origin	Mean	-0.005	0.511*	0.006	0.551
		(0.230)	(0.265)	(0.275)	(0.377)
	Std.dev.			0.760*	1.532*
				(0.350)	(0.387)
Animal welfare	Mean	-0.455	0.796*	-0.587*	0.923*
		(0.238)	(0.260)	(0.277)	(0.309)
	Std.dev.			0.613	0.689
				(0.416)	(0.414)
Product packaging	Mean	0.000	0.000	0.000	0.000
	Std.dev.			0.000	0.000
Log-likelihood		-818.368	-688.808	-794.535	-663.325
Pseudo R2		0.05	0.03		
Number of observations		2555	2096	2555	2096
AIC		1660.74	1401.62	1637.07	1374.65
BIC		1730.89	1469.39	1777.37	1510.20

Note: * Indicate significance at the 5 % level. Numbers in parentheses are standard errors

Estimated coefficients for price, appearance, environmental impact, tradition, country of origin and animal welfare values within the baby food set were negative which showed that they were less important than product packaging. Product packaging which was chosen as the base category for both food value sets, was not the least important value according to the estimated model within baby food category.

The estimated standard deviations appeared to be large and statistically significant for most of the attributes in RPL model implying significant heterogeneity in the sample with regard to relative importance of food values. However, estimated standard deviations were not

statistically significant for some attributes. Suggesting that preferences for baby food products being appealing to the senses, looking appealing and being environmentally or animal friendly processed, and being environmentally friendly for adult food, were statistically homogenous.

4.2 Shares of Preferences for the Food Values

One disadvantage from evaluating importance of each value resulting from the MNL and RPL model is that the estimates are difficult to interpret, since the "estimates themselves have no natural interpretation" (Lusk & Briggeman, 2009, p. 191). Therefore, on the basis of RPL estimates, I calculated the shares of preferences for each of the food values. Table 4 shows the shares of preferences for each of the food values, from the most to least important when purchasing baby food and adult food.

Table 4. Preference shares and ranking of importance of baby and adult food values

Rank	Baby food		Adult food	
	Food value	**Share**	**Food value**	**Share**
1	Safety	0.134	Taste	0.138
2	Nutrition	0.133	Nutrition	0.105
3	Taste	0.131	Environmental impact	0.092
4	Fairness	0.130	Naturalness	0.082
5	Convenience	0.082	Price	0.080
6	Country of origin	0.076	Animal welfare	0.077
7	Product packaging	0.075	Fairness	0.076
8	Price	0.068	Appearance	0.073
9	Animal welfare	0.042	Safety	0.069
10	Environmental impact	0.037	Convenience	0.063
11	Appearance	0.035	Tradition	0.061
12	Tradition	0.033	Country of origin	0.053
13	Naturalness	0.025	Product packaging	0.031

When looking at most and least important values regarding baby food 13 % of the respondents would rate safety (13.4 %), nutrition (13.3 %), taste (13.1 %) or fairness (13.0 %) as the most important food values. Food values as convenience (8.2 %), country of origin (7.6 %), product packaging (7.5 %) were also important to the respondents. On average 6.8 % of

respondents believed that price is the most important food value when purchasing baby food, but price was on average half as important as safety. It appeared that only three to 4 % of the respondents would value animal welfare (4.2 %), environmental impact (3.7 %), appearance (3.5 %) and tradition (3.3 %) as most important. Safety, nutrition, taste and fairness were approximately three to four times as important as animal welfare, environmental impact, appearance and tradition. Only 2.5 % of the respondents would choose naturalness as most important food value when purchasing baby food products.

According to the preference shares for each value regarding adult food, taste of the product seemed to be the most important attribute (14 %). Interestingly, nutrition (10.5 %), environmental impact (9.2 %), naturalness (8.2 %) and price (8.0 %) had the next highest shares of preference, with between 8 % to 11 % of respondents on average claiming these to be the most important values when purchasing adult food. Only around 7 % respondents would rate safety as the most important.

5. Discussion

Respondents´ preferences seemed to be quite diverse when considering the differences in the ranking of the importance of food values when purchasing baby food and adult food. Figure 4 reflects food value rankings which are based on the calculation of the mean preference shares based on the results of the RPL model shown in the previous chapter (See Table 4). Parents ranked food values as taste, nutrition and environmental impact highest when purchasing food for their own consumption, in contrast to food values as safety, nutrition, taste and fairness which are ranked highest when purchasing food for their babies.

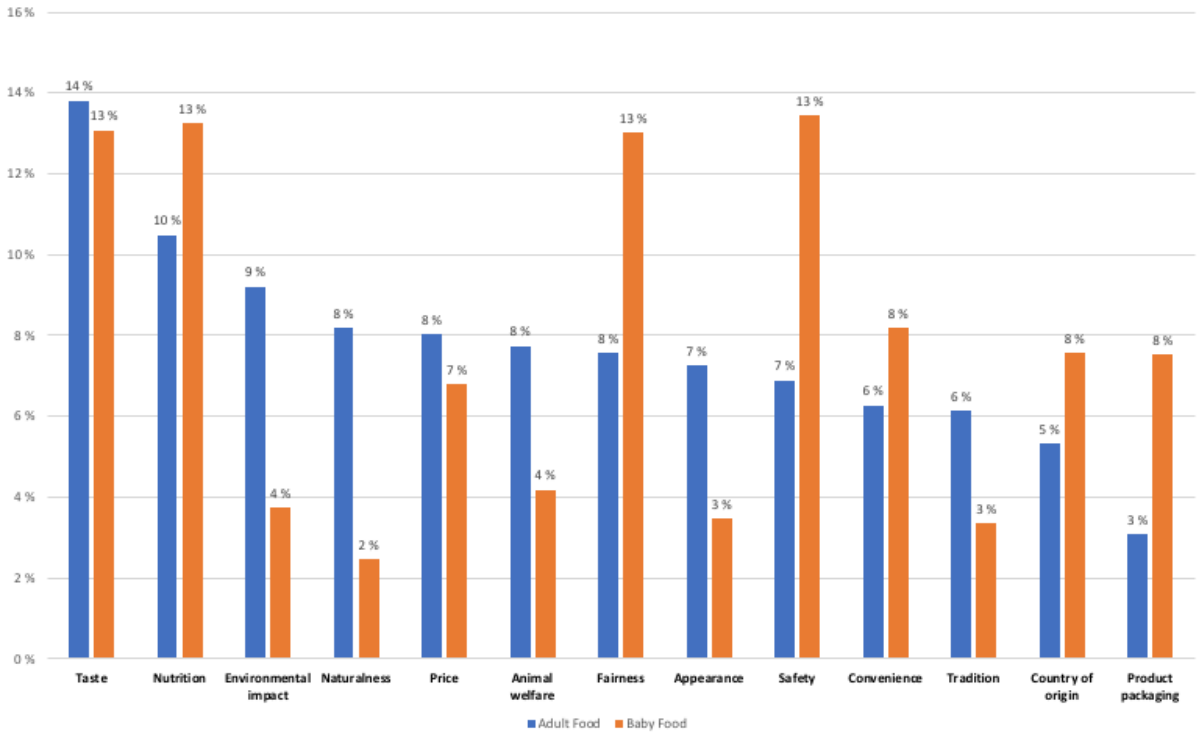

Figure 4. Shares of preferences for baby and adult food based on the results of the online survey about food values among Norwegian parents

When purchasing food for their babies, half of the sample consider food values as safety, nutrition, taste and fairness as most important. Interestingly, when purchasing food for themselves, preference shares are distributed more smoothly within the food value set. Thus, it seems that the rankings of baby food values are more sensitive to the smaller number of products offered in the store, while adult food incorporates wide variety of different food products.

Figure 4 shows taste as the value which is ranked the highest among respondents when considering purchase of both adult and baby food. On the one hand, respondents could have valued taste as the most important food value when purchasing adult food because of sensory pleasure. On the other hand, the reason of high importance of taste when purchasing baby food may be because babies will refuse to eat anything that, according to their senses, does not taste good. Indeed, also some previous studies investigating consumer food values, found that taste has a high value to consumers (Bazzani et al., 2017; Lusk & Briggeman, 2009). For instance, according to findings of the research of Bazzani et al. (2017), Norwegians rate taste as the third-most crucial value. However, the food value set in the aforementioned paper included somewhat different food value set which consisted of: naturalness, safety, environmental impact, origin, fairness, nutrition, taste, convenience, appearance, price, animal welfare and novelty, and which might influence the rankings of the food values.

According to research results, nutrition is ranked as being highly essential when purchasing food in both food categories, meaning that respondents pay high attention to the nutritional content of the product. The data sample in this study consisted of 96 % women who ranked nutrition as the second most important food value when purchasing food for themselves. The research of Wardle et al. (2004), who compared gender differences in health behaviors among young adults, found that women are more likely to attach greater importance to healthy eating and also have stronger beliefs in healthy eating. Confirming that findings from the this

particular research about ranking of nutrition might be in line with findings from other studies investigating consumer food choices (Lusk & Briggeman, 2009; Wardle et al., 2004).

Interestingly, fairness is ranked as the fourth most important food value among the survey respondents when purchasing food for their babies. This food value concerning ethical aspect of food production might be of high importance due to the fact that, according to Bazzani et al. (2017), Norwegians highly consider social and economic welfare of farmers in the Norwegian food system. However, I do not have any explanation for why respondents ranked fairness so highly especially when considering purchase of baby food. In spite of that, I could speculate that survey respondents might have misunderstood or misinterpreted the definition of fairness, since the Figure 4 reflects much higher ranking of fairness when purchasing baby food.

Next, price was ranked similarly in both food categories valued as the most important food value when purchasing baby food by 7 % of respondents and by 8 % when purchasing adult food. This finding corresponds to findings of Bazzani et al. (2017) who found that 7 % of Norwegian consumers valued price as most important food value when purchasing food. The ranking of price as the eighth-most important when purchasing baby food and fifth-most important when purchasing adult food among Norwegian respondents may be a reflection of more equal income distribution in Norway, compared to higher price ranking in other countries (Bazzani et al., 2017). Also, the lower ranking of price when purchasing baby food may be due to the fact that parents might be willing to provide proper nutrition and a balanced diet for the babies without paying so much attention on pricing of the baby food products.

Safety is clearly one of the four most important values with the share of 13 % within baby food category, contrary to only 7 % when purchasing food for adults. The high importance of safety supports results from studies estimating food values for a wide range of food products. The research of Lusk and Briggeman (2009) found that among consumers the in U.S. safety is the most important and significantly more important than other food values. Research of

Bazzani et al. (2017), which was focusing on food value ranking in Norway, also showed that safety is clearly the most important value with a share of 38 % among Norwegian consumers. Hence, it is very surprising that safety was ranked so low when considering purchase of adult food. However, it is necessary to notice that population sample in this particular study is very narrow when comparing with the two previously mentioned studies. Furthermore, Brunsø et al. (2002) claims that safety guides credence and trust on food products. The surprisingly low ranking of safety as the most important food value when purchasing adult food may be due to concern that respondents believe that food products available in Norwegian market are safe. And, instead, respondents are valuing naturalness as fourth most important food value when purchasing adult food.

Another interesting finding in this study is ranking of naturalness across both food categories, since respondents would rate naturalness as the least important when purchasing baby food. The study of Bazzani et al. (2017) found that naturalness was valued as the second most important food value among Norwegian respondents who had a children which is disagreement with the current study. The definition of naturalness in this study incorporated a food production without use of genetically modified organisms (GMOs). Results from the studies carried out across Europe have found that consumers tend to be very skeptical towards the use of GMOs in food production, associating it with considerable health risk (Brunsø et al., 2002). Thus, such an unusual ranking of naturalness may be due to the fact that respondents of the survey believe that baby food products available in Norwegian Market is mainly produced without the use of synthetic fertilizers, pesticides, hormones, GMOs and irradiation. For instance, in 2016 there were no registered products or plants which contained GMOs in Norway, while 80 % of products in U.S. contains GMOs (Norsk Helseinformatikk, 2016).

According to the estimated results, parents ranked almost all of the experience attributes (taste, appearance) higher when purchasing food for their own consumption. That is

understandable since they consume products themselves and can personally experience for instance taste of the purchased product. The only experience attribute ranked higher when purchasing baby food is convenience. Indeed, it is very handy to consume products which are easy to cook and consume, and it is especially of high importance to parents on parental leave when feeding their babies, due to lack of spare time when at home with the baby.

During the last decade an increasing public interest is placed on sustainable, high quality and safe food (Grunert, Sonntag, & Glanz-Chanos, 2018). For instance, many consumers expect food production process taking into account issues like animal welfare and other social and ethical attributes (Grunert et al., 2018) as fairness, sustainable product packaging and environmental impact. Results revealed that respondents value aspects related to sustainability such as environmental impact, animal welfare higher when purchasing food for their own consumption. Whereas food values related to safe food (safety and country of origin) higher when purchasing food for their babies. Therefore, interestingly, when respondents purchase food for own consumption they also consider sustainable consumption motives while when purchasing food for their babies it becomes very important to provide safe food for the babies.

Commonly, people tend to link country of origin with safety. Research on fresh meat have shown that European consumers tend to rank country of origin as one of the most important safety quality cues for fresh meat (Alfnes, 2004). Even though the previous research covers very specific food products, this research could imply the same linkage. Country of origin and safety are ranked higher among respondents when purchasing products for their babies.

According to the previously mentioned sales data of organic food showing that parents presumably are much more likely to choose organic food over conventional food for their babies than for themselves, an interesting phenomenon can be observed. Namely, respondents when purchasing food for their babies are not considering several organic food features since

results revealed that when purchasing baby food respondents valued food values as safety and nutrition much higher then food values characterizing organic food, as naturalness and animal welfare.

5.1 Preferences for Organic Food

Overall, the results indicated that respondents had a very different food values between baby and adult food categories. Presumably different organic food consumption patterns within each food category may explain some of the similarities or differences in preferences for food values between the food categories. To test that, I divided the data sample into different subgroups based on the revealed preference questions towards organic food. I estimated the RPL model[2] for each subgroup and computed the shares of preferences for each of the food values within different subgroups.

Across the entire sample 60 % of respondents answered that they had purchased organic food for their baby in the last month, further, 14 % of respondents claimed that they had not, and finally, 25 % of the respondents were not sure or chose an "other" option. When respondents answered revealed preference question about organic food in their own consumption, 52 % of respondents had consumed organic food in the last month. It is worthy to mention that majority of the respondents who were purchasing organic food for their babies were purchasing organic food for their own consumption.

Figure 5 and Figure 6 represents the estimated shares of preferences for each of the food values within two subgroups across baby food and adult food categories respectively- first, respondents who had purchased organic food for their babies in the last month and second, all other respondents who had not purchased organic or were not sure.

[2] The estimated model results for both food categories are included in the appendix

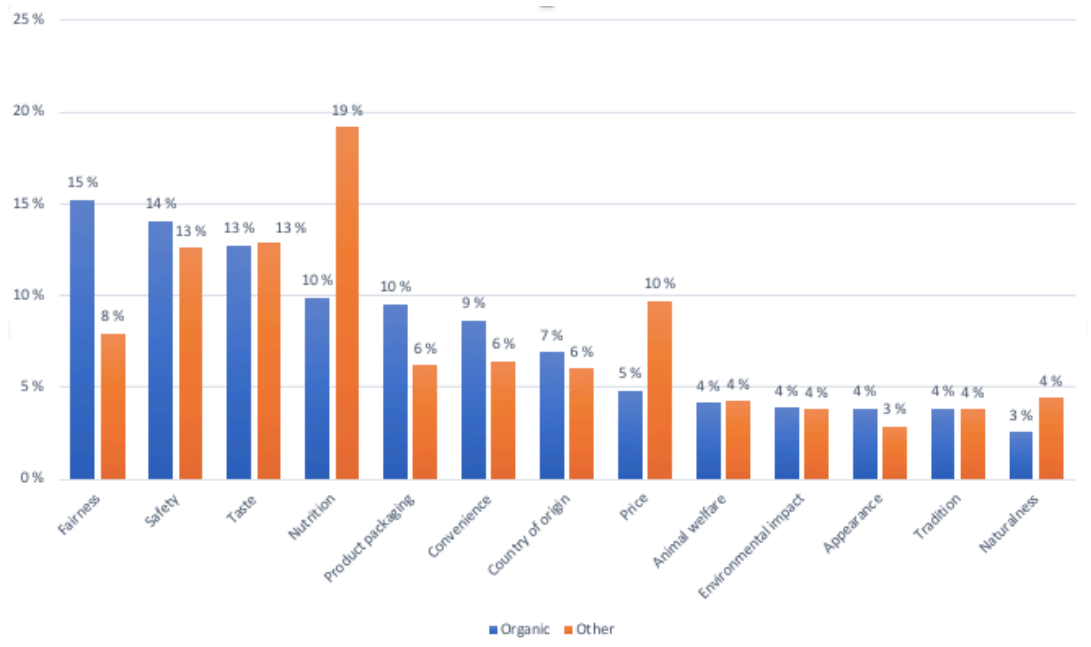

Figure 5. Shares of preferences of food values based on the revealed preferences for organic food towards baby food

It was possible to observe that the shares of preferences for the different food values tend to be very similar for the majority of food values. However, it was also possible to note some very sharp differences in the ranking of food values. Organic food consumers rate fairness higher than other respondents and, in contrary, the shares of preferences for nutrition and price are ranked lower compared to non-organic food purchasers.

Second, based on the results reported in Figure 6, organic food consumers value food values as naturalness, environmental impact, appearance and convenience higher when purchasing food for themselves than other respondents across the sample. Surprisingly, nutrition is rated as the most important food value between respondents who did not report that they had consumed organic food lately.

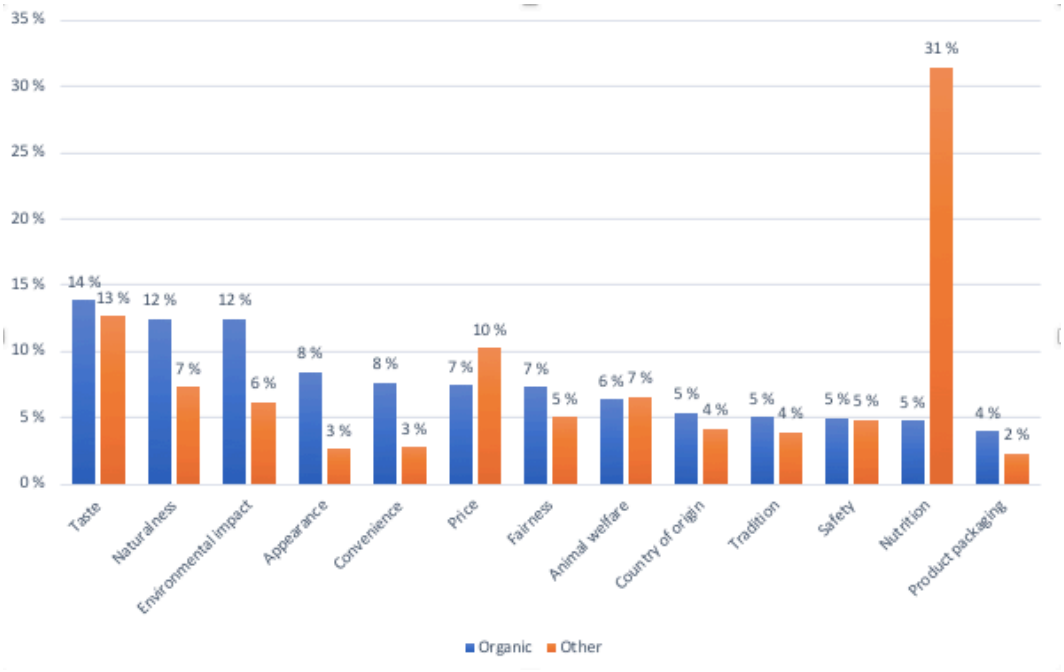

Figure 6. Shares of preferences of food values based on the revealed preferences for organic food towards adult food

Generally, organic baby food purchasers gave more importance to food values related to fairness and sustainable product packaging, while organic non-purchasers higher ranked food values as nutrition and price. Furthermore, respondents who had bought organic food for their own consumption gave more importance on naturalness and food values related to sustainability issues, but organic non-purchasers clearly gave more importance to nutrition.

However, the revealed preferences for organic food within each food category cannot explain the similarities or differences in preferences for food values between the food categories. Because, the number of respondents within each subsample is quite small and estimated parameters mostly not statistically significant at the 5% significance level (See Appendix 2).

5.1 Limitations

The current analysis has some limitations. First, the survey suffered from a lack of real incentive compatible conditions. Due to a limited budget, respondents did not get paid or receive a gift for participating in the survey. Incentives may increase response rate to the survey either by facilitating contact with potential respondents or by stimulating their cooperation (Singer & Ye, 2013).

Second, the survey consisted of somewhat similar best-worst questions and respondents might have lost attention or felt bored. In addition, the chosen survey software- Survey Monkey, did not provide necessary question answer display options for the best-worst questions. Respondents could not mark best and worst options, according to existing answer display option, instead, respondents were asked to value the most important (best) attribute with 1 and the least important (worst) attribute with 4 or 5 depending on the number of attributes in the question. Some respondents misunderstood response mechanism and rated all attributes using all numbers in the scale from 1 to 5. Indeed, some of the respondents did not complete all of the questions in the survey. Two aforesaid limitations may evoke respondent fatigue problem (Lavrakas, 2008).

Last, the results are based on the relatively small sample size due to the limited scale of this research and very specific population group. Larger sample size could improve the accuracy of the model estimates. Aforesaid may mean that conclusions drawn in this research does not necessarily represent the population of Norwegian parents of babies in the age of 0-24 months.

6. Conclusions and Implications

This research compared food values between two food categories to see whether there is a reason to believe that there exists a common set of food values that guide the purchase of both- baby food and adult food. The relative importance that parents of babies in the age of 0-24 months placed on each of the food values when purchasing food for their babies and food for their own consumption was measured. A best-worst scaling method was used, which involves people stating the most and the least important issue out of a set of competing issues.

Data were collected from an online survey conducted between 22nd of February and 1st of March of 2018 in Norway in Facebook social networking website. Overall 90 people answered the online survey, 96 % of the respondents were female having a first child. Based on the previous research of Lusk and Briggeman (2009) about food values, a list with definitions of thirteen food values was composed. Following food values were included in the food value set: naturalness, taste, price, safety, convenience, nutrition, tradition, country of origin, fairness, appearance, environmental impact and product packaging.

Results revealed clear differences in preference rankings for food values between baby and adult food categories. To such a degree the results indicated that the same person, when making purchasing decisions, considers two different food value sets which depends to whom the food is purchased for. Namely, parents have different food preferences when purchasing food for their own consumption versus when purchasing food for their babies.

The magnitude of differences and similarities in the ranking of food values between the baby and adult food varies between the food values. When choosing food for their own

consumption respondents ranked food values as taste, nutrition and environmental impact highest, in contrast to food values as safety, nutrition, taste and fairness which are ranked highest when purchasing food for their babies. Also, respondents valued aspects related to sustainability as environmental impact, animal welfare higher when purchasing food for their own consumption. And in contrary food values related to safe food including safety and country of origin higher when purchasing food for their babies.

Finally, the research proposes several implications for different organizations within private and public sectors: food researchers, baby food producers, policy makers, and public interest groups. This research provides the evidence that could be valuable for food researchers, particularly, even though the concept of food values might determine individuals´ food choices for different food products, according to this research, consumers have more than one food value set which guides the purchase of food products across different food categories. In addition, research suggests that baby food producers must focus on nutritional content of the product and safety issues. For example, the unethical and aggressive marketing strategy of the baby food products company Nestlé have led to the boycott of the company's products around the world (International baby Food Action Network, 2017). Thus, since parents in this research value safety and nutritional concerns as the most important food values when purchasing baby food, companies producing baby food might consider a marketing strategy promoting and emphasizing safety issues. In addition, the rankings of food values can be useful and informative in terms of product differentiation using food labels. For instance, companies could emphasize nutritional content of the product. Results of this research could form a market opportunity for producers, namely, by trying to slightly modify existing products or creating new products for toddlers older than 2 years, since a similar food value set could guide the purchase of products for toddlers as for babies. Also, retailers could benefit from the results of this study, since low price is valued less when considering purchase of baby food.

This research could be valuable for organizations within public sector. First, governmental authorities could use the food value rankings when developing health intervention programs since the rankings of food values allow the targeting of parental diet to affect the children's diet. Additionally, this research could guide the activities of the public interest groups aiming to improve health of babies, such as International Baby Food Action Network (IBFAN), who could use the results of this research to promote and support breastfeeding by targeting important food values for parents towards baby food (e.g. safety, nutrition).

This research represents a first attempt to measure peoples' values within a specific food category, namely the baby food category. Still more work is needed. Similar research should be repeated with a larger and more representative sample of consumers to be able to identify the relative importance of food values in the population of parents with babies in the age of 0-24 months.

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Appendices

Appendix 1. Example of survey questionnaire in Norwegian

<u>This questionnaire corresponds to Question Group 1 out of 5</u>

Velkommen til denne spørreundersøkelsen om ditt forhold til babymat og mat til deg selv i ditt hushold!
Denne spørreundersøkelsen er for respondenter med spedbarn i alderen 0-24 måneder.

Undersøkelsen er anonym og tar ca. 3-5 minutter å fullføre.

Svarene vil bli brukt for en masteroppgave. Denne undersøkelsen blir gjennomført av en mastergradsstudent innen samfunnsøkonomi ved Norges miljø- og biovitenskapelige universitet (NMBU).

Jeg setter pris på at du tar deg tid til å svare på undersøkelsen.

<u>Side 1.</u>

1. **Har du spedbarn i alderen 0-24 måneder som bor sammen med deg?**
   - ☐ Ja
   - ☐ Nei
   - ☐ Vet ikke

<u>Side 2. Babymat.</u>

2. **Hvor ofte spiser ditt spedbarn babymat kjøpt i butikk, hjemmelaget babymat, og morsmelk?**

	Aldri/Nesten aldri	Sjelden	Av og til	Vanligvis	Alltid/Nesten alltid
Babymat kjøpt i butikken	☐	☐	☐	☐	☐
Hjemmelaget babymat	☐	☐	☐	☐	☐
Morsmelk	☐	☐	☐	☐	☐

3. Hvor ofte kjøper du følgende spedbarnsprodukter til ditt spedbarn?

	Aldri/Nesten aldri	Sjelden	Av og til	Vanligvis	Alltid/Nesten alltid
Morsmelkerstatning	☐	☐	☐	☐	☐
Tilskuddsblanding	☐	☐	☐	☐	☐
Babygrøt eller babyvelling	☐	☐	☐	☐	☐
Mellommåltid (fruktsmoothies,-pureer,-mos, og lignende laget av frukt)	☐	☐	☐	☐	☐
Middagsmåltid (pureer, gryter, frikaseer, og lignede med eller uten kjøtt, fisk og grønnsaker)	☐	☐	☐	☐	☐
Yoghurtprodukter	☐	☐	☐	☐	☐
Baby snacks (baby kjeks, puffa mais, ris kaker, og lignende)	☐	☐	☐	☐	☐

Side 3.

På de neste sidene vil vi at du skal svare på tolv rangeringsspørsmål om hva som er mest og minst viktig for deg når du skal kjøpe babymat til ditt spedbarn eller mat til deg selv.

For at vi skal vite hvilke rangeringsspørsmål du skal få, må du først svare på spørsmålet nedenfor:

4. Vennligst velg det første tallet på listen nedfor. Rekkefølgen på listen varierer fra person til person. For noen vil det første tallet være 5, for andre vil det første tallet være 8 eller kanskje 2. For at vi skal vite hvilke rangeringsspørmål du har fått på de neste sidene er det viktig at du velger det første tallet på lista.

☐ 0
☐ 1
☐ 2
☐ 3
☐ 4
☐ 5
☐ 6
☐ 7
☐ 8
☐ 9

Side 4. Babymat til ditt spedbarn i deres hushold. S1

På denne siden vil vi at du skal svare på seks rangeringsspørsmål. I hvert spørsmål vil du se fire eller fem egenskaper ved maten, og du skal si hvilken av disse egenskapene som er mest og minst viktig for deg når du skal kjøpe babymat til ditt spedbarn.

5. Hva er mest og minst viktig når du kjøper **babymat til ditt spedbarn?**

Vennligst velg det alternativet som er viktigst og marker det med 1 og det alternativet som er minst viktig og marker det med 4. Du trenger ikke å markere 2 og 3.

- **Enkelhet** (enkelt å lage, ta med og spise)
- **Ernæring** (type og mengde fett, proteiner, vitaminer, etc.)
- **Dyrevelferd** (effekten av babymatproduksjonen på dyrevelferd)
- **Smak** (i hvilken grad liker spedbarnet smaken og lukten av babymaten)

6. Hva er mest og minst viktig når du kjøper **babymat til ditt spedbarn?**

Vennligst velg det alternativet som er viktigst og marker det med 1 og det alternativet som er minst viktig og marker det med 5. Du trenger ikke å markere 2,3 og 4.

- **Pris** (pris du betaler for babymaten)
- **Sikkerhet** (at det er viktig for deg å vite at babymaten ikke vil forårsake helseproblemer i det lange løpet)
- **Rettferdighet** (i hvilken grad produksjonen er etisk og rettferdig)
- **Naturlighet** (at babymaten ikke inneholder syntetiske sprøytemidler, GMO eller andre kjemikalier)
- **Opprinnelsesland** (landet der produktet er laget)

7. Hva er mest og minst viktig når du kjøper **babymat til ditt spedbarn?**

Vennligst velg det alternativet som er viktigst og marker det med 1 og det alternativet som er minst viktig og marker det med 4. Du trenger ikke å markere 2 og 3.

- **Miljøvennlig produktemballasje** (at matemballasjen er produsert på en bærekraftig måte)
- **Tradisjon** (å bevare tradisjonelle matvaner i landet ditt)
- **Utseende** (i hvilken grad fremstillingen av maten er tiltalende)
- **Miljøpåvirkning** (effekten av babymatproduksjonen på miljø)

8. Hva er mest og minst viktig når du kjøper **babymat til ditt spedbarn?**

Vennligst velg det alternativet som er viktigst og marker det med 1 og det alternativet som er minst viktig og marker det med 4. Du trenger ikke å markere 2 og 3.

- **Naturlighet** (at babymaten ikke inneholder syntetiske sprøytemidler, GMO eller andre kjemikalier)
- **Rettferdighet** (i hvilken grad produksjonen er etisk og rettferdig)
- **Tradisjon** (å bevare tradisjonelle matvaner i landet ditt)

□ **Sikkerhet** (at det er viktig for deg å vite at babymaten ikke vil forårsake helsemessige problemer i det lange løpet)

9. Hva er mest og minst viktig når du kjøper **babymat til ditt spedbarn?**

Vennligst velg det alternativet som er viktigst og marker det med 1 og det alternativet som er minst viktig og marker det med 5. Du trenger ikke å markere 2,3 og 4.

□ **Dyrevelferd** (effekten av babymat produksjon på dyrevelferd)
□ **Opprinnelsesland** (landet der produktet er laget)
□ **Smak** (i hvilken grad liker spedbarnet ditt smaken og lukten av babymaten)
□ **Ernæring** (type og mengde fett, proteiner, vitaminer, etc.)
□ **Miljøvennlig produktemballasje** (at matemballasjen er produsert på en bærekraftig måte)

10. Hva er mest og minst viktig når du kjøper **babymat til ditt spedbarn?**

Vennligst velg det alternativet som er viktigst og marker det med 1 og det alternativet som er minst viktig og marker det med 4. Du trenger ikke å markere 2 og 3.

□ **Pris** (pris du betaler for babymaten)
□ **Miljøpåvirkning** (effekten av babymatproduksjonen på miljø)
□ **Utseende** (i hvilken grad fremstilling av babymaten er tiltalende)
□ **Enkelhet** (enkelt å lage, ta med og spise)

Side 5. Din mat. V1

På denne siden vil vi at du skal svare på seks rangeringsspørsmål. I hvert spørsmål vil du se fire eller fem egenskaper ved maten, og du skal si hvilken av disse egenskapene som er mest og minst viktig for deg når du skal kjøpe mat til deg selv.

11. Hva er mest og minst viktig når du kjøper **mat til deg selv?**

Vennligst velg det alternativet som er viktigst og marker det med 1 og det alternativet som er minst viktig og marker det med 4. Du trenger ikke å markere 2 og 3.

□ **Naturlighet** (at maten ikke inneholder syntetiske sprøytemidler, GMO eller andre kjemikalier)
□ **Enkelhet** (enkelt å lage, ta med og spise)
□ **Ernæring** (type og mengde fett, proteiner, vitaminer, etc.)
□ **Dyrevelferd** (effekten av mat produksjon på dyrevelferd)

12. Hva er mest og minst viktig når du kjøper **mat til deg selv?**

Vennligst velg det alternativet som er viktigst og marker det med 1 og det alternativet som er minst viktig og marker det med 5. Du trenger ikke å markere 2,3 og 4.

□ **Pris** (pris du betaler for maten)
□ **Sikkerhet** (at det er viktig for deg å vite at maten ikke vil forårsake helsemessige problemer i det lange løpet)
□ **Tradisjon** (å bevare tradisjonelle matvaner i landet ditt)
□ **Opprinnelsesland** (landet der produktet er laget)

□ **Rettferdighet** (i hvilken grad produksjonen er etisk og rettferdig)

13. Hva er mest og minst viktig når du kjøper **mat til deg selv?**

Vennligst velg det alternativet som er viktigst og marker det med 1 og det alternativet som er minst viktig og marker det med 4. Du trenger ikke å markere 2 og 3.

□ **Miljøvennlig produktemballasje** (at matemballasjen er produsert på en bærekraftig måte)
□ **Smak** (i hvilken grad liker dere smaken og lukten av maten)
□ **Miljøpåvirkning** (effekten av matproduksjonen på miljø)
□ **Utseende** (i hvilken grad fremstilling av maten er tiltalende)

14. Hva er mest og minst viktig når du kjøper **mat til deg selv?**

Vennligst velg det alternativet som er viktigst og marker det med 1 og det alternativet som er minst viktig og marker det med 4. Du trenger ikke å markere 2 og 3.

□ **Sikkerhet** (at det er viktig for deg å vite at maten ikke vil forårsake helsemessige problemer i det lange løpet)
□ **Utseende** (i hvilken grad fremstilling av maten er tiltalende)
□ **Enkelhet** (enkelt å lage, ta med og spise)
□ **Opprinnelsesland** (landet der produktet er laget)

15. Hva er mest og minst viktig når du kjøper **mat til deg selv?**

Vennligst velg det alternativet som er viktigst og marker det med 1 og det alternativet som er minst viktig og marker det med 5. Du trenger ikke å markere 2,3 og 4.

□ **Miljøvennlig produktemballasje** (at matemballasjen er produsert på en bærekraftig måte)
□ **Miljøpåvirkning** (effekten av mat produksjonen på miljø)
□ **Naturlighet** (at maten ikke inneholder syntetiske sprøytemidler, GMO eller andre kjemikalier)
□ **Rettferdighet** (i hvilken grad produksjonen er etisk og rettferdig)
□ **Smak** (i hvilken grad liker dere smaken og lukten av maten)

16. Hva er mest og minst viktig når du kjøper **mat til deg selv?**

Vennligst velg det alternativet som er viktigst og marker det med 1 og det alternativet som er minst viktig og marker det med 4. Du trenger ikke å markere 2 og 3.

□ **Tradisjon** (å bevare tradisjonelle matvaner i landet ditt)
□ **Ernæring** (type og mengde fett, proteiner, vitaminer, etc.)
□ **Dyrevelferd** (effekten av mat produksjon på dyrevelferd)
□ **Pris** (pris du betaler for maten)

Side 6. Økologisk mat til ditt spedbarn

På denne siden vil vi at du skal svare på spørsmål om økologisk mat til ditt spedbarn.

Ifølge Mattilsynet kan økologisk mat kjennetegnes av minimal bruk av tilsetningsstoffer, god velferd for husdyra og ingen bruk av kjemisk-syntetiske plantevernmidler.
Debio-merket er det norske merket som viser at produktet er godkjent som økologisk. Merket brukes på norske og utenlandske økologiske produkter.

17. Har du kjøpt økologisk mat til ditt spedbarn i løpet av den siste måneden?

- □ Ja
- □ Nei
- □ Vet ikke
- □ Annet (vennligst spesifiser)

18. Vennligst spesifiser andelen økologisk mat ditt spedbarn har spist den siste måneden (ekskludert morsmelk):

0% _____ **100%**

Side 7. Økologisk mat til deg

På denne siden vil vi at du skal svare på spørsmål om økologisk mat til deg selv

Ifølge Mattilsynet kan økologisk mat kjennetegnes av minimal bruk av tilsetningsstoffer, god velferd for husdyra og ingen bruk av kjemisk-syntetiske plantevernmidler.
Debio-merket er det norske merket som viser at produktet er godkjent som økologisk. Merket brukes på norske og utenlandske økologiske produkter.

19. Har du kjøpt økologisk mat til eget konsum i løpet av den siste måneden?

- □ Ja
- □ Nei
- □ Vet ikke
- □ Annet (vennligst spesifiser)

20. Vennligst spesifiser andelen økologisk mat i ditt matinntak den siste måneden:

0% _____ **100%**

Side 6. Demografiske spørsmål

21. Hvor mange personer bor i husholdet ditt*?
*Inkludert barn som bare bor med deg i visse perioder (minst 5 dager i måneden)

	Ingen	1	2	3	4 og mer
Antall voksne (over 18 år)	☐	☐	☐	☐	☐
Antall barn (mellom 2-17 år)	☐	☐	☐	☐	☐
Antall spedbarn (mellom 0-24 måneder)	☐	☐	☐	☐	☐

22. Hvor gammelt er ditt yngste barn (spedbarn)?

☐ 0-3 måneder
☐ 4-7 måneder
☐ 8-11 måneder
☐ 12-24 måneder
☐ Vil ikke svare

23. Du er en:

☐ Mann
☐ Kvinne
☐ Vil ikke svare

24. Hva er din høyeste fullførte utdanning?

☐ Grunnskolenivå
☐ Videregående skolenivå
☐ Fagskolenivå
☐ Universitets- og høyskolenivå- bachelor
☐ Universitets- og høyskolenivå- master
☐ Høyere enn mastergrad
☐ Vil ikke svare

25. Hva var den totale bruttoinntekten i husholdingen din i fjor (2017)?

Vennligst merk av et av følgende alternativer:

☐ NOK 0- NOK 200 000
☐ NOK 201 000- NOK 400 000
☐ NOK 401 000- NOK 600 000
☐ NOK 601 000- NOK 800 000
☐ NOK 801 000- NOK 1000 000
☐ NOK 1001 000- NOK 1200 000
☐ NOK 1201 000 og mer
☐ Vil ikke svare

26. **Hvor i Norge bor du?**
Vennligst velg den regionen i Norge du bor i:

- □ Oslo (Oslo fylke)
- □ Viken (Akershus, Buskerud og Østfold)
- □ Innlandet (Hedmark, Oppland)
- □ Telemark-Vestfold
- □ Agder (Aust- og Vest-Agder)
- □ Rogaland
- □ Vestlandet (Hordaland, Sogn og Fjordane)
- □ Møre og Romsdal
- □ Trøndelag (Sør- og Nord- Trøndelag)
- □ Nordland
- □ Nord- Hålogaland (Troms, Finnmark)
- □ Vil ikke svare

Jeg vil gjerne takke deg for at du tok deg tid til å delta i studien. Dine svar er viktige for meg, og til stor hjelp i mitt forskningsprosjekt.

Hvis du har spørsmål eller kommentarer angående studien, kan du kontakte meg på denne e-postadressen: liza@nmbu.no

Appendix 2. Estimates from RPL models for different subgroups (organic and non-organic food consumers)

Food value		Baby Food		Adult Food	
		Organic	**Non-organic**	**Organic**	**Non-organic**
Safety	Mean	0.391	0.709	0.239	0.759
		(0,393)	(0.430)	(0.440)	(0.563)
	Std.dev.	1.322*	1.021*	-0.543	2.583*
		(0.393)	(0.458)	(0.500)	(0.755)
Nutrition	Mean	0.045	1.135*	0.184	2.630*
		(0.383)	(0.454)	(0.474)	(0.555)
	Std.dev.	1.279*	1.294*	1.136*	-1.485*
		(0.388)	(0.472)	(0.440)	(0.523)
Taste	Mean	0.295	0.725	1.251*	1.715*
		(0,337)	(0.382)	(0.456)	(0.529)
	Std.dev.	-0.235	0.064	0.903*	-1.172*
		(0.390)	(0.475)	(0.408)	(0.413)
Price	Mean	-0.681*	0.449	0.634	1.520*
		(0.343)	(0.457)	(0.438)	(0.514)
	Std.dev.	0.162	1.082*	0.865	-1.503*
		(0.674)	(0.486)	(0.573)	(0.453)
Naturalness	Mean	-1.318*	-0.341	1.148*	1.179*
		(0.380)	(0.416)	(0.399)	(0.510)
	Std.dev.	1.092*	0.944*	0.032	1.928*
		(0.448)	(0.443)	(0.455)	(0.631)
Convenience	Mean	-0,102	0.044	0.661	0.204
		(0.351)	(0.384)	(0.403)	(0.516)
	Std.dev.	0.875*	0.595	-0.478	2.117*
		(0.384)	(0.571)	(0.463)	(0.634)
Appearance	Mean	-0.920*	-0.778*	-0.753*	0.150
		(0.361)	(0.362)	(0.380)	(0.513)
	Std.dev	0.907*	-0.266	0.196	2.207
		(0.395)	(0.750)	(0.357)	(0.545)
Environmental impact	Mean	-0.903*	-0.490	1.137*	1.007*
		(0.372)	(0.391)	(0.416)	(0.402)
	Std.dev.	-0.247	0.203	0.777	-0.222
		(0.640)	(0.414)	(0.507)	(0.461)
Fairness	Mean	0.471	0.260	0.607	0.802
		(0.385)	(0.421)	(0.419)	(0.449)
	Std.dev.	1.076*	1.093*	0.966*	-0.895*
		(0.448)	(0.427)	(0.400)	(0.373)
Tradition	Mean	-0.905*	-0.486	0.237	0.551
		(0.350)	(0.380)	(0.478)	(0.534)
	Std.dev.	-0.973*	-0.833*	1.039*	-1.392*
		(0.368)	(0.406)	(0.483)	(0.434)
Country of origin	Mean	-0.316	-0.034*	0.302	0.610
		(0.332)	(0.372)	(0.450)	(0.449)
	Std.dev.	-0.658*	0.714	-1.180*	0.409
		(0.306)	0.439	(0.439)	(0.362)
Animal welfare	Mean	-0.830*	-0.376	0.469	1.072
		(0.365)	(0.363)	(0.410)	(0.426)

(continued)

	Std.dev.	0.999*	0.265	-0.368	0.562
		(0.426)	(0.525)	(0.441)	(0.455)
Product packaging	Mean	0.000	0.000	0.000	
	Std.dev.	0.000	0.000	0.000	0.000
Log-likelihood		-519.807	-400.421	-360.345	-302.177
Number of observations		1700	1270	1120	1020

Note: * Indicate significance at the 5 % level. Numbers in parentheses are standard errors

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