An Innovative Animal Welfare Labelling Approach –

The Consumer Perception and Intention to Use

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Abstract

Animal welfare food labels are still most frequently communicated to the consumer as static images. As a solution to the abundance of different food labels, this study presents an innovative approach to animal welfare labelling. It combines technology and insights from Shared Decision Making, which has its origin in medical research, to involve consumers in the decision process behind the labels' standards and allow them access to accurate and accountable data on farming conditions. By means of a consumer survey, this study investigates the consumers' perception of the innovative labelling approach in comparison to a "static" labelling approach. Perception is measured by the constructs *trust, ease-of-use, usefulness* and *understanding.* Difference in product category, knowledge of welfare standards and several demographic variables are hypothesized to moderate the effects of the labelling approach on the perception constructs. Furthermore, this study explores the relation between the consumers' perception and their intention to use the labelling approach. Results suggest that (i) consumers are more likely to trust the innovative labelling approach compared to the static labelling approach, positively moderated by consumers' age; (ii) usefulness is an important predictor for consumers' intention to use the labelling approaches.

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1 Introduction

The awareness of food labelling as a direct communication medium towards the consumer is growing among actors in the food system. Food packages are littered with diverse labels including health claims, fair-trade claims, welfare claims and marketing claims (Tonkin, Wilson, Coveney, Webb, & Meyer, 2015). With regards to welfare labels, different formats can be distinguished. A label could for example be a certificate, proving the achievement of particular welfare standards, or might be a visualisation of a rating system that indicates the welfare level to which products have been produced (Kehlbacher, Bennett, & Balcombe, 2012).

What most food labels have, however, in common is that they are frequently communicated to the consumer as a static image on the food package. This makes sense, as a label is generally a visual representation of measurements done before it is presented to consumers. However, the abundance of different food labels nowadays combined with information gaps at the consumer side may lead to consumer confusion (Grunert, Hieke, & Wills, 2014).

Building on this, this study presents an innovative animal welfare labelling approach that enables more intensive interaction between the consumer and the food system. It combines the use of technology and insights from *Shared Decision Making*, which is a communication approach that originates in the field of medicine (Glyn Elwyn et al., 2012). Since it allows consumers to actively determine their animal welfare preferences, it provides a potential solution to the abundance of different static food labelling approaches. Additionally, consumers' awareness of welfare standards may improve by increasing consumers' involvement and understanding.

As consumers are the primary recipients and users of welfare labels, it is important to find out what consumers value about the innovative *Shared Decision Making* approach (from now on referred to as "innovative labelling approach"). Against this background, this study explores consumer perception of the innovative labelling approach and compares this to a static labelling approach. For this, a quantitative research method is used by means of a survey. In order to determine consumers' perceptions, four constructs have been selected to be measured in the survey: (i) *ease-of-use, (ii) usefulness, (iii) trust* and (iv) *understanding*. Additionally, the effect of consumer perception on the *intention to use* is explored for both the static and the innovative labelling approach.

Moreover, building on research considering technology adoption or food labelling, the relation between consumer characteristics and perception is taken into account (Venkatesh, Thong, & Xu, 2012; Wee et al., 2014). The characteristics (i) *age, (ii) gender, (iii) education* and (iv) *income* have been found to be relevant determinants of consumer perception in the areas of technology and organic food consumption (e.g. Hosseini, Fatemifar, & Rahimzadeh, 2015; Venkatesh et al., 2012; Wee et al., 2014). Hence, these four characteristics are adopted as moderating variables together with knowledge of animal welfare and the difference in product types.

Against this background, the central research question of this study is:
Will consumers perceive the innovative labelling approach more positively compared to a static labelling approach?

2 Theoretical Background

2.1 Traditional Labelling Approaches

Labelling represents a good tool for policymakers and marketers because of its role as a main information channel between buyers and suppliers (Bianchi, Krampe, & Ingenbleek, 2020). A label can distinguish a company's product from its competitors' products. Additionally, regulators can create labels or support the use of labels to achieve socially desirable objectives like improving human safety or mitigating environmental hazards (Golan, Kuchler, Mitchell, Greene, & Jessup, 2001). Third-party entities can also have a role in the certification of labels or develop them themselves (Lusk, 2011).

Consumers' preferences with regards to animal welfare differ. To meet the preferences of different consumers' segments and create market opportunities, different labelling strategies can be adopted (Vecchio & Annunziata, 2012). Labels can be distinguished from one another in the way it is presented to the consumer. For instance, a welfare label can be a certificate that certifies the achievement of certain minimum welfare standards (Kehlbacher et al., 2012). An example of such a label is the EU organic logo (Van Loo, Caputo, Nayga, & Verbeke, 2014). Alternatively, a label could be a visualization of a rating system, also based on certain standards (Kehlbacher et al., 2012). A Dutch example of this form is the "Beter Leven" label. Other ways of differentiating include pictorial, textual, symbolic or graphic representation (Van Loo et al., 2014).

A less common variation of labelling is technology-based labelling. This may be defined as a labelling approach that makes use of technology to provide consumers information. An example of this is the use of QR-codes for labelling, which has been researched in a number of recently published studies (Higgins, Wolf, & Wolf, 2014; Lombardi et al., 2017). In general, however, there is a lack of analysis of technology-based labelling in literature (Latino Maria, Menegoli, & Corallo, 2019).

Consumers are increasingly concerned about the ethical, environmental and social attributes of their food, which leads to an increasing demand for sustainable food products (Van Loo et al., 2014). In Europe, this is also the case for farm animal welfare-friendly products (Kehlbacher et al., 2012). These developments are accompanied by a growing number of different sustainability and welfare labels, which may lead to consumer confusion (Grunert et al., 2014).

Increasing concern of ethical and environmental aspects of food does not necessarily lead to ethical or pro-environmental purchasing (Van Loo et al., 2014; Wee et al., 2014). This phenomenon is known as the intention-behaviour gap (Vermeir & Verbeke, 2006). According to Saba and Messina (2003) despite a positive attitude towards buying organic products, consumers are often constrained by certain barriers. Examples of such barriers are scarce consumers' involvement and scarce perceived effectiveness of consumers' choices (Vermeir & Verbeke, 2006). Thus, increasing consumer involvement and being transparent about the effect of consumers' choice may help to close this gap.

Pieniak et al. (2007) suggest that labels play no other role than explicit information communication. However, a label might be able to offer consumers and actors in the food system much more than just a means to communicate. This study has drawn from principles from traditional and technological labelling and literature on *Shared Decision Making* to come up with an innovative technology-based animal welfare labelling framework. The implementation of principles from *Shared Decision Making* literature may increase consumers' feeling of involvement. Moreover, its intensive use of technology may improve transparency and decrease consumers' confusion with regards to animal welfare labels

in general. Therefore, this labelling approach allows consumers to take a more sophisticated data-based decision in regard to animal welfare.

2.2 Shared Decision Making Approach and the Integration of Technology

Shared Decision Making (SDM) is an approach that originates in the field of medicine. It can be defined as "an approach where clinicians and patients share the best available evidence, when faced with the task of making decisions, and where patients are supported to consider options, to achieve informed preferences" (G. Elwyn et al., 2010). In order to ensure that all the needed information is shared, SDM intends to create the conditions for a good relationship between the patient and the clinician. Additionally, it intends to respect patient autonomy and to increase involvement by placing emphasis on the patient's preferences (Glyn Elwyn et al., 2012; Stiggelbout et al., 2012). Based on their preferences and all available information, the patient is invited to choose between treatment options. Naturally, the clinician supports this decision-making process.

The relation between a consumer and the entity that provides an animal welfare label is comparable with the relationship between the patient and clinician, in that both the patient and consumer are in need of information from the other party in order to make decisions. However, both the consumer and the patient have information to offer as well that may improve said decision. The main principles of SDM might then also be applicable in the context of animal welfare labelling. Therefore, this study presents a labelling framework in which the main principles of SDM are used in the context of animal welfare labelling. The presented labelling approach is referred to as the "innovative labelling approach".

First, a relationship with the consumer is established by having a transparent and accountable database. Consumers want to be sure that data are not manipulated (Bianchi et al., 2020). Transparency enables external scrutiny and is thus important to the validity of an initiative (Main et al., 2014). Additionally, it may lead to higher self-discipline of producers along with better monitoring and control (Passantino, Conte, & Russo, 2008). The data itself is gathered not only by looking at inputs at the farm level (e.g. how often an animal is fed), but also by focusing on the outcomes (e.g. the animal's level of stress). These objective outcome results can be obtained by using precision livestock farming (PLF) technologies. Consequently, they can be measured against scientifically proven animal welfare parameters. The presence of PLF sensors should lead to a dynamic system that improves itself continuously.

Second, consumers are involved in the decision-making process. That is, the label encourages consumers to make informed personal decisions with regard to animal welfare products, by providing access to farming data and allowing consumers to play an active role in information seeking (Bianchi et al., 2020). The innovative technology-based label will offer consumers the possibility to quickly explore animal welfare information of a certain product through their mobile devices or with terminals at the point-of-sale, utilising e.g. QR codes or bar codes on the product's packaging in combination with an app. Furthermore, this system may allow consumers to look up additional information or interact with the producer (Bianchi et al., 2020). It is hypothesized that this will increase consumers' feeling of involvement and trust in animal welfare claims.

Third, consumers' preferences are taken into account. The label allows consumers to embed their values, priorities and preferences in the process of buying animal food products (Bianchi et al., 2020). By the use of an app in which consumers can select animal welfare criteria that fit with their personal

preferences or with the recommendations of a recognised animal protection institution, consumers can actively determine their animal welfare standards. For example through scanning products or having a conversation with a chatbot in an online shopping environment, based on the consumers' preferences indicated in an app, the technology can reduce the number of products to only present those that fit with the consumers' preferences. The information gained may also be used in a feedback loop throughout the value chain, providing stakeholders important information of the consumers' consumption preferences on which production can be adapted.

2.3 The Consumer Perception

As the innovative labelling approach is meant to be used primarily by consumers, research related to consumer perception and preference may provide valuable insights for further development of the innovative label. Due to the label's technological aspects and its focus on animal welfare, determinants of consumer perception can be found in at least two areas: (i) the *adoption of the technology* and (ii) the *attitude towards products with certain animal welfare standards*.

Besides, the afore-mentioned intention-behaviour gap may be present with regards to the innovative labelling approach as well. Therefore, a positive attitude towards animal welfare and the innovative labelling approach may not always lead to actual use of the label. Certain factors constrain consumers from behaving according to their intentions (Saba & Messina, 2003). Therefore, it is important to explore factors that might act as constraints to consumers.

2.3.1 The Consumer Perception – The adoption of the technology

Due to the technological aspects of the innovative label, adoption of new technology might be a relevant consumer constraint. Technology acceptance research offers useful models to measure this. According to the Technology Acceptance Model, two beliefs are of primary relevance regarding technology acceptance: *perceived ease-of-use* and *perceived usefulness* (Davis, Bagozzi, & Warshaw, 1989). A more recent, related model is the Unified Theory of Acceptance and Use of Technology (UTAUT2) (Venkatesh et al., 2012). One of the factors that is being mentioned in this model is *expected effort*, which is defined by Laumer, Maier, and Gubler (2019) as "the degree of ease associated with consumers' use of technology". This definition comes close to the factor *perceived ease-of-use* from the TAM. Another factor from the UTAUT2 is *performance expectations*, defined as "the degree to which using a technology will provide benefits to consumers in performing certain activities" (Laumer et al., 2019). This factor is comparable to the more general factor *usefulness* from the TAM. Moreover, usefulness has been found to be a positive moderator regarding e-service quality (Luo & Lee, 2011) and has been found to have a positive effect on customer attitude and adaptation (Jahangir & Begum, 2008) as well as on purchase intention (Chung, Kang, & Lee, 2011). Therefore, *ease-of-use* and *usefulness* are adopted in the analysis as determinants of perception.

2.3.2 The Consumer Perception – The attitude towards products with certain animal welfare standards

As no research work has yet investigated the innovative labelling approach, research in related areas like animal welfare labelling and organic food consumption was explored. The aforementioned

UTAUT2 proposes *hedonic motivation* as another factor of technology acceptance (Venkatesh et al., 2012). In previous research, *motivation* has been explored in relation with the TAM (R. Thompson, 1998; Venkatesh, 2000). Next to its relevance in technology acceptance literature, *motivation* in general is regarded as a key determinant of successful animal welfare labelling (Grunert et al., 2014). In turn, consumers' *motivation* depends on *awareness, understanding and trust*. Just like *motivation,* these factors are seen as key determinants of successful animal welfare labelling (Grunert et al., 2014; Keeling et al., 2012). These factors will be adopted in the analysis in different ways.

(i) In order for a labelling approach to be effective, consumers' *trust* is key (Tonkin et al., 2015). Konuk (2018) adds to this that the perceived trust of organic labels increase perceived value, which in turn contributes to a higher purchase intention. Other research has shown a relation between the level of trust and likeliness to buy organic food (Daugbjerg, Smed, Andersen, & Schvartzman, 2014; Nuttavuthisit & Thøgersen, 2017) or perceived quality of e-services (Luo & Lee, 2011). Therefore, *trust* is adopted as a determinant of perception.

(ii) *Understanding* of the labelling approach is adopted as a determinant of perception as well.

(iii) *Awareness* in this case can be defined as awareness or knowledge of the practices behind the label. Higgins et al. (2014) found that, in a wine consumption context, consumers that are already very knowledgeable about and interested in organic production of wine will be more likely to adopt technology in their wine purchase decision. When this is adapted to the context of animal welfare, it may imply that a related factor like *knowledge* of farm animal welfare leads to a higher adoption of the labelling technology. Indeed, McEachern and Warnaby (2008) found that purchase decisions for animal welfare labelled products are especially influenced by knowledge about the label and the standards the label is based on. Hence, *knowledge* of farm animal welfare is adopted in the analysis. As this factor does not change depending on difference in labels, it is adopted in the analysis as a moderating variable.

At this point, four determinants of consumer perception have been found: *ease-of-use, usefulness, trust* and *understanding.* Additionally, *knowledge* has been adopted as a moderating variable.

In the analysis, which will be explained in more detail in the next section, the perception of a simplified experience with the innovative labelling approach will be compared with the perception of a static labelling approach. In the survey, consumers are randomly assigned a product category (either meat or dairy) to serve as example products for the duration of the survey. Difference in product category will be adopted as a moderating variable as well. Considering the sensitive nature of slaughtering animals for consumption (Adamczyk, 2018), meat products might be perceived to be more directly related to animal welfare compared to more processed products like dairy. Therefore, the innovative labelling approach is expected to be perceived more positively by the consumers in the product category "meat". Moreover, trust in the welfare standards of the dairy sector was found to be significantly higher than the trust of the meat sectors (Spain, Freund, Mohan, Meadow, & Beacham, 2018). Hence, consumers might value a transparent labelling system more when it is related to meat products.

With regards to both organic produce and technology services, research has shown that consumer perception has a positive effect on purchase intention (Revels, Tojib, & Tsarenko, 2010; Wee et al., 2014). As expected, three of the four determinants of consumers' perception have been found to positively relate to a person's intention to use: *trust, ease-of-use* and *usefulness* (Lean, Zailani, Ramayah, & Fernando, 2009; Shin, Jung, & Chang, 2012). As the innovative labelling system will not be something purchasable on itself, intention to use rather than intention to purchase is a relevant

construct. The innovative labelling system has not been realised yet, which means that only the *expected intention to use* is measurable.

2.4 Socio-demographic Factors

Because research into label usage is often focused on specific labels or product categories, it is hard to generalise results. However, a main barrier for the buying and using of sustainable products is a high price (Grunert et al., 2014). G. D. Thompson (1998) and Wee et al. (2014) found this to be true for organic products in general.

The fact that price is found to be a main barrier for organic consumption, may imply that consumers with a higher income are more likely to buy organic products. Indeed, several studies found organic food consumption to rise with increasing income (Torjusen, Lieblein, Wandel, & Francis, 2001; Wee et al., 2014). Other socio-demographic factors like education, age and gender have also been found to significantly influence organic consumption in plenty of studies (D'Souza, Taghian, Lamb, & Peretiatko, 2007; Govindasamy & Italia, 2000; Grunert et al., 2014; Vecchio & Annunziata, 2012; Wee et al., 2014). In several studies, the female gender has been found to positively influence organic consumption (Irianto, 2015; Lockie, Lyons, Lawrence, & Mummery, 2002). The female gender as well as higher levels of education and income tend to show a positive association to animal welfare preferences in particular. (Boaitey & Minegishi, 2020; Vanhonacker, Verbeke, Van Poucke, & Tuyttens, 2007).

Education, age, gender and income are especially interesting, as they have been found to also be of relevance regarding technology acceptance. Age and gender have a moderating effect on the factors that affect technology acceptance and use (Bianchi et al., 2020; Venkatesh et al., 2012). In other research, age has been negatively correlated to the adoption of technologies (Hosseini et al., 2015). Education was related to knowledge and skills that in turn affect behavioural beliefs towards technology acceptance and use, whereas gender difference was suggested to influence usage behaviour in information systems research (Tarhini, Elyas, Akour, & Al-Salti, 2016). Finally, Lam, Chiang, and Parasuraman (2008) found that income, together with the other factors, has been found to affect technology acceptance.

Another reason to integrate these factors into the research model is that, in consumer research, they often appear to be related to each other. For example, Govindasamy and Italia (1999) found younger individuals to be more likely to pay more for organic produce. They reason that this may be caused by the fact that household incomes typically start to lower beyond a certain age. Gender and the level of education have also been associated with difference in income (Christofides, Polycarpou, & Vrachimis, 2013; Johansson, 2020). Besides, a dynamic relation exists between education and gender causing a gender education gap (Riphahn & Schwientek, 2015). For all of these reasons, the factors *age, gender, education* and *income* have been adopted in the analysis as moderating variables.

As indicated before, perception will be measured with the constructs *ease-of-use, usefulness, trust* and *understanding.* Furthermore, for both labels the relation between perception and *intention to use* will be explored. The variables *knowledge* and *product category,* together with the socio-demographic variables *age, gender, education* and *income* will serve as moderators.

Based on previous research findings, the following hypotheses are proposed:

H1: *Consumers will have a more positive perception of the innovative labelling approach compared to the static labelling approach (measured by the constructs: ease of use, usefulness, understanding and trust).*

> ***H1.1:*** *Consumers find the innovative labelling approach easier to use than the static labelling approach.*
>
> ***H1.2*** *Consumers trust the innovative labelling approach more than the static labelling approach*
>
> ***H1.3:*** *Consumers find the innovative labelling approach more useful than the static labelling approach.*
>
> ***H1.4:*** *Consumers find the innovative labelling approach easier to understand than the static labelling approach.*

H2: *Consumer perception of the innovative labelling approach will have a positive effect on consumers' expected intention to use the innovative labelling approach*

H3: *Knowledge, education, income and the female gender will have a positive moderation effect on the perception of the innovative labelling approach compared to the static label. Age will have a negative moderation effect.*

H4: *The meat product category will have a positive moderation effect on the perception of the innovative labelling approach.*

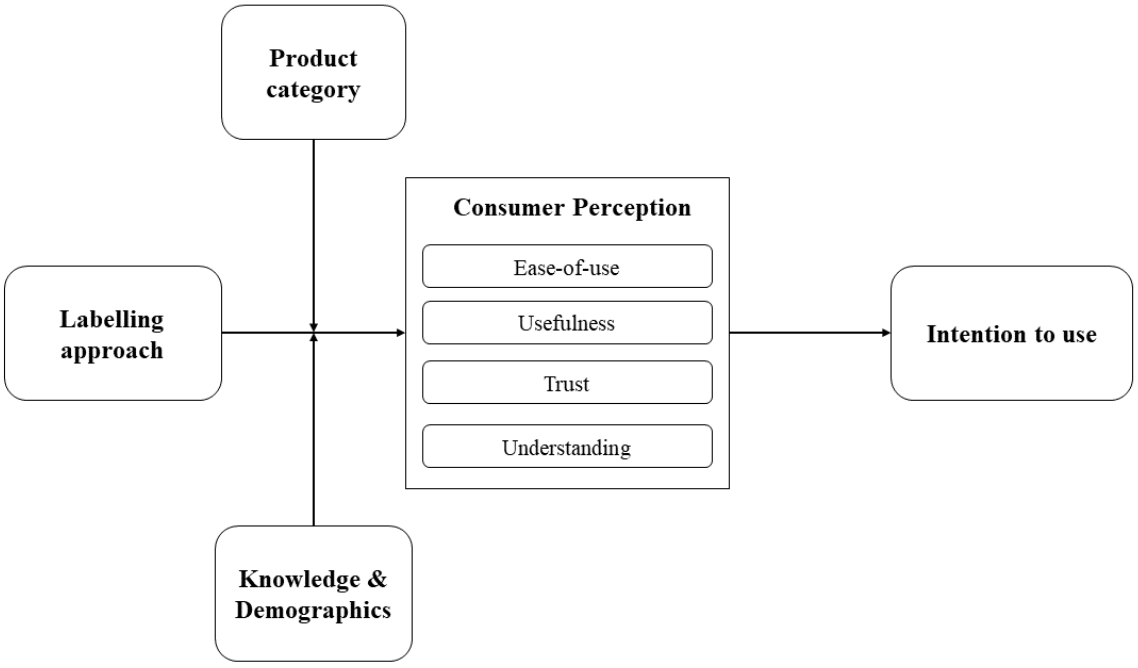

Figure 1: Research model

3 Methods

A quantitative survey was employed in this study to examine the consumers' perception of the innovative labelling approach in comparison to a traditional "static" labelling approach. The empirical data were collected by using an online questionnaire conducted in June 2020. Participants were recruited by means of a voluntary sampling, using social media platforms like Facebook, WhatsApp or existing participant pools.

Before the start of the survey, consumers were informed about the goal of the survey and were assured that their responses are stored anonymously. The remainder of the survey consisted of two main parts.

(i) In the first part the consumers were randomly shown either a meat or dairy product, and were introduced to a static labelling approach including basic labelling information. Thereafter, they were asked to evaluate their perception of the label and their intention to use the label.

In the second part, the innovative technology based labelling system was introduced. A list of products was provided, from the same product category as shown in the first step. Subsequently, a chatbot was introduced. Through a written communication with the chatbot, consumers were asked to indicate the animal welfare criterion that they found most important. Based on the consumers' choice, the chatbot offered additional information about the chosen criterion and showed a product assortment meeting the – by the consumer – indicated preferences. A chatbot was chosen as a communication tool because, (i) chatbots are already often applied in the online shopping context and therefore, (ii) chatbots are a realistic solution to provide consumers further information in an online shopping environment.

After the exposure to the chatbot, consumers were asked questions about their perception of the innovative labelling approach and their intention to use it. Finally, consumers were asked control questions about their attitude towards farm animal welfare and technology in general, their knowledge of farming practices and personal demographical characteristics.

3.1 Measurement

This study uses a two-by-two design (see *table 1*). The perception of every participant is going to be measured on two different labels: the static and the innovative labelling approach. However, participants are randomly assigned to either a survey integrating meat or a survey integrating dairy (cheese) products. Thus, the labelling approach is a within-subject factor and product category was measured on between-subject level. Note that, except for the product pictures and names that are used as examples the two surveys are completely similar. This means that, in the end, the participants can be divided in two groups.

Table 1: Two-by-two design

	Product category meat	**Product category dairy**
Static label approach	*Static + meat*	*Static + dairy*
Innovative label approach	*Innovative + meat*	*Innovative + dairy*

3.2 Variables

Validated scales were adapted from previous studies to measure the relevant constructs. To measure consumers' perception of the labelling approaches, several constructs were used.

(i) Three items for measuring consumers' trust were adapted from Thomson (2006).

(ii) Three items for measuring usefulness were adapted from Hilken, de Ruyter, Chylinski, Mahr, and Keeling (2017).

(iii) Three items for measuring ease-of-use were adapted from Inman and Nikolova (2017).

(iv) Four items for measuring knowledge or familiarity with a product category were adapted from Kelting, Duhachek, and Whitler (2017). Instead of a product category, consumers were asked about their familiarity with animal welfare standards.

(v) Understanding of the labelling approach was measured by one item extracted from a scale used by White and Peloza (2009). After experiencing the chatbot, consumers were asked if the approach is easy or difficult to understand. Only a single item was extracted, as this would improve the accuracy of measuring the construct. Moreover, Bergkvist and Rossiter (2007) found that single item measures can be highly reliable and valid.

(vi) To measure consumers' intention to use, they were asked to indicate their agreement with the following statement: "I would choose to buy animal based products with the support of the shared decision-making system to have more guarantees on animal welfare in farming".

All the items were measured using seven-point Likert scales and can be found in appendix A. In the last section of the survey, some demographic data of the participants were collected among which age, gender, education level and income level.

4 Analysis and Results

4.1 Demographics

At the start of the analysis, the survey was completed by 54 consumers. One of the consumers had to be excluded from the analysis due to missing data. Additionally, six extreme outliers were deleted from the analysis, as they were more than three standard deviations away from the mean. After this procedure, 47 consumers were left. Of these consumers, 26 completed the survey integrating the 'dairy' product category and 21 answered the survey integrating the 'meat' product category. Twenty-five of the consumers were female and 21 were male (45 percent). Only one indicated the gender "diverse". Most consumers, more than 70 percent, were still in education. This fits with the income statistics, which show that almost 40 percent of the consumers have a monthly net household income of below 1300€. It should, however, be mentioned that a substantial part of the consumers (20 percent) did not want to answer this question. Around half of the consumers finished a bachelor study; for consumers studying in the Netherlands, both HBO and WO bachelors were included. All consumers except 2 originated from a European country. From the European consumers, almost 60 percent was Dutch. Another 20 percent was Italian. The mean age of the consumers was 25.06 (SD=9.07)

4.2 Data Validity

To ensure a high internal validity, the presentation of the two different labelling approaches has been designed to be as comparable as possible. The same product pictures are used throughout the whole questionnaire, although the presentation of the innovative labelling approach needed to show more products in comparison to the one product shown in the static labelling condition. Moreover, the criteria of both labels are based on the same existing label, the "Beter Leven" label. Additionally, to prevent participants from missing details in the label descriptions by reading/clicking too fast, questions about the text are asked and participants are required to wait ten seconds before continuing after a description.

4.3 Data Analysis

The data analysis that was conducted consisted of two steps. To test the hypotheses *H1, H3 and H4,* a repeated-measures MANCOVA was computed. There are several reasons for this approach. First, the mediator (perception) consists of four variables. Second, the variables for perception are asked twice to every consumer: once for the static labelling approach and once for the innovative labelling approach. Third, the possible effect of several moderating variables was taken into account. *H2* was tested using two multiple regression analyses, one for each labelling approach.

4.3.1 Labelling approach and Consumer Perception

Before running the repeated-measures MANCOVA, all constructs for both groups were tested on normality. The Q-Q plots of every construct are included in appendix B. Based on the Q-Q plots, for all constructs normality could be assumed, except for the construct *understanding.* This was not expected either, as *understanding* was measured with a single item only.

The first step was to explore whether there is a relation between the labelling approach and the consumer perception. To prepare for the repeated-measures MANCOVA, some variables had to be merged. The scales for *trust, ease-of-use* and *usefulness* existed of three items each. To check if each of these items reliably measure the corresponding construct, Cronbach's alpha was used. The same was done for one of the moderators, *knowledge,* which consists of 4 items.

Since all the items from the constructs for perception were asked twice (for the static and innovative label) and there were two groups of consumers (meat and dairy product categories), thirteen Cronbach's alpha scores were computed. Except for two, all items indicated a good to very good reliability, displayed by a CA-value of 0.7 or above. The CA-value for the items on *ease-of-use* for the static labelling approach (dairy group) was .683. The score for the items on *trust* for the innovative labelling approach (meat group) was .585. These items are lower than .7, which is generally seen as a minimum score for reliability. However, the items have not been deleted for two reasons. Firstly, the same items showed to be reliable in the comparable scales for the other labelling approach and product category. Secondly, the scales as a whole are validated. The value of having validated scales would be partly lost if one item is deleted, especially as the different scales are compared to each other.

The descriptive statistics already give valuable information about what can be expected in the analysis. The following graph (*figure 2*) *shows* the mean scores on the constructs for perception of the different labelling approaches.

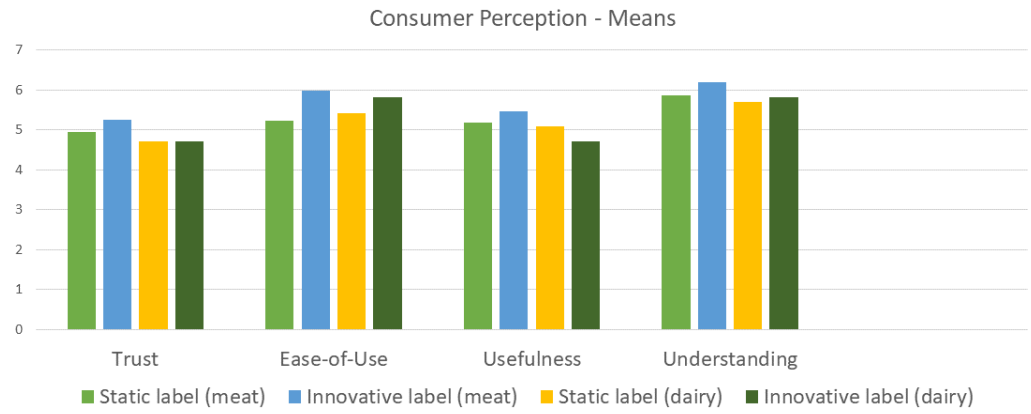

Figure 2: Means for consumer perception

The results of the repeated-measures MANCOVA revealed no significant main effects for *ease-of*-use (F[1,40] = .791, p = .379, ηp^2 = .019), no significant main effects for *usefulness* (F[1,40] = .852, p = .361, ηp^2 = .021) and no significant main effects for *understanding* (F[1,40] = 1.005, p = .322, ηp^2 = .025). For *trust,* however, when applying a p-value treshold of $p < 0.1$, a significant main effect was found (F{1,40] = 3.846, p = .057, ηp^2 = .088).

This indicates that, only with regards to the variable *trust*, there is a significant difference between the static and innovative labelling approach. A subsequent profile plot shows that the variable of *trust* is significantly higher for the innovative labelling approach. According to the same multivariate tests, *age* significantly moderates this effect (F{1,40] = 7.740, p = .008, ηp^2 = .162). *Table 2* gives an overview of these effects. The related SPSS output including the profile plot can be found in appendix C.

Table 2: Repeated-measures MANCOVA - the effect of labelling approach on trust, including moderators

Effect	Value (Wilks' Lambda)	F	Hypothesis df	Error df	Sig
Labelling approach	.912	3.846	1	40	.057*
Labelling approach * Age	.838	7.740	1	40	.008**
Labelling approach * Gender	.940	2.555	1	40	.118
Labelling approach * Education	.978	.880	1	40	.354
Labelling approach * Income	1.000	.012	1	40	.912
Labelling approach * Knowledge	.968	1.305	1	40	.260
Labelling approach * Product category	.983	.711	1	40	.404

*Note: * $p < 0.1$; ** $p < 0.05$*

A mean split was used to investigate this moderation effect in more detail. The data was split in two groups: all consumers aged 25 or younger and all consumers aged 26 or older. Subsequently, the means of the different age groups were compared. It appeared that for both labelling approaches, older consumers generally gave a higher score on the *trust* items. The difference between the age

groups was even slightly bigger for the innovative labelling approach. *Table 3* gives an overview of the results.

Table 3: Mean scores on trust for different age groups

	Age	**Mean score on *trust***
Innovative Labelling Approach	25 or younger	4.8649
	26 or older	5.2667
Static Labelling Approach	25 or younger	4.7568
	26 or older	5.0333

4.3.2 Consumer Perception and Intention to Use

In the second step, the relationship between consumer perception and *intention to use* was explored. This is done by use of two multiple regression analyses, one for each labelling approach. From the Q-Q plots it is assumed that the data of *intention to use* is normally distributed. These plots can be found in appendix B. For both labelling approaches the assumption of multicollinearity is not completely met, as not all correlations with the dependent variable are above .3. However, especially the correlation between *usefulness* and *intention to use* is quite high in both cases. Furthermore, the assumption of a linear relationship between the predictors and the dependent variable is checked via P-P Plots and met. Since the sample size was quite low at the moment of the analysis, the adjusted R Square was interpreted.

Regarding the static labelling approach, the model summary shows an adjusted R square of .387, meaning that the model explains 38,7% of the variance of the outcome variable *intention to use* ($p < .000$). Furthermore, the ANOVA table shows that there is at least one significant relation between the predictors and the outcome variable ($F[4,42] = 8.260$, $p<.000$). From the Coefficients table it becomes clear that only the variable *usefulness* significantly contributed to the change in the dependent variable (Beta = .661, $p < .000$). *Table 4* gives an overview of these results. The related SPSS output can be found in appendix D1.

Table 4: Result of multiple regression analysis for the static labelling approach

	Unstandardized Coefficients		Standardized Coefficients		
	B	**Std. Error**	**Beta**	**T**	**Sig.**
(Constant)	1.797	1.149		1.564	.125
Trust	-.292	.195	-.196	-1.501	.141
Understanding	.069	.156	.058	.445	.658
Ease-of-use	.142	.183	.107	.773	.444
Usefulness	.764	.142	.661	5.375	.000
F = 8.260	R = .664		Adjusted R Square = .387		

Regarding the innovative labelling approach, the assumptions are again met except for multicollinearity. The adjusted R square shows that a much smaller part of the variance is explained by the model: 23,1% ($p = .004$). There is at least one significant relation between the predictors and the outcome variable ($F[4,42] = 4.464$; $p = .004$) according to the ANOVA table. The coefficients table then shows that, again, only the variable *usefulness* has made a significant contribution to the change in the

dependent variable (Beta = .640; *p* = .001). *Table 5* gives an overview of these results. The related SPSS output can be found in appendix D2.

Table 5: Result of multiple regression analysis for the innovative labelling approach

	Unstandardized Coefficients		Standardized Coefficients		
	B	**Std. Error**	**Beta**	**T**	**Sig.**
(Constant)	4.113	2.664		1.544	.130
Trust	-.087	.256	-.055	-.341	.735
Understanding	-.104	.379	-.039	-.275	.785
Ease-of-use	-.325	.495	-.114	-.656	.516
Usefulness	.785	.219	.640	3.577	.001
F = 4.464	R = .546		Adjusted R Square = .231		

4.3.3 Hypotheses

With regards to the first part of the analysis, difference in perception of the labelling approach were significant only for the measure *trust.* As the perception of *trust* for the innovative labelling approach was higher, H1.2 was supported. Since *usefulness* was the only significant predictor of the intention to use the innovative labelling approach, H2 was partly supported. H3 was rejected, as *knowledge, education, income* and the *female gender* did not have a significant moderation effect at all and age had a significant positive moderation effect, which was hypothesized to be negative. H4 was rejected as well, as the *meat product category* did not have any significant moderation effect on the perception of the innovative labelling approach. In *figure 3*, an overview of the significant and non-significant main effects and interaction effects is given.

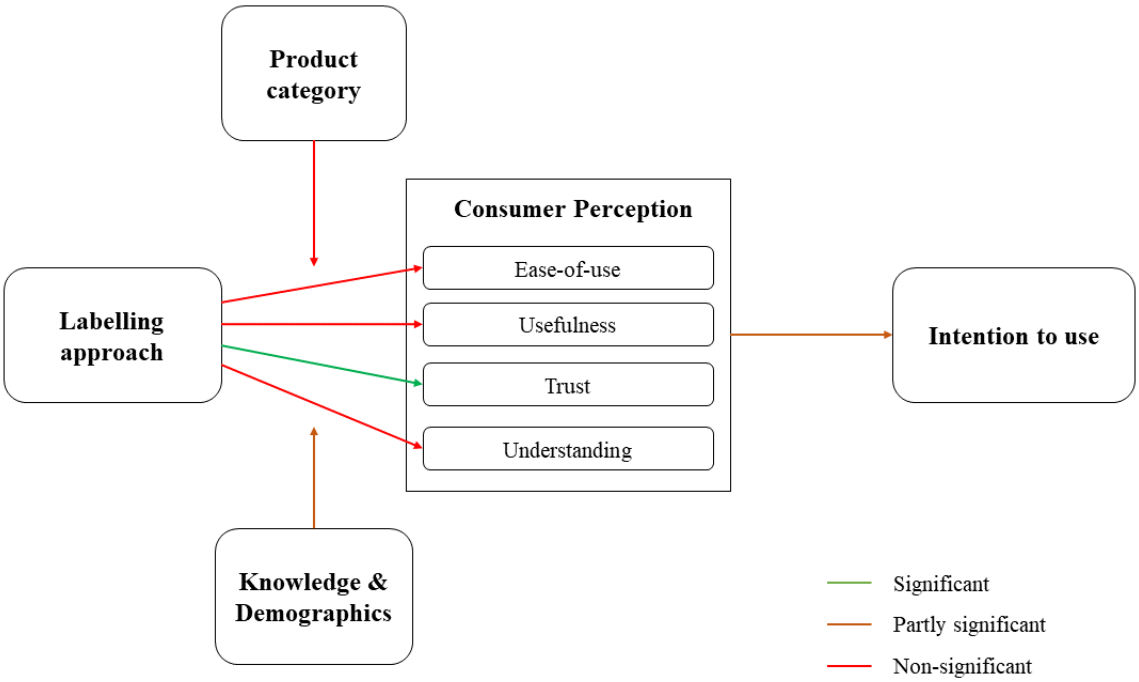

Figure 3: Research model with results

5 Discussion

The results of this study highlight two main findings. First, consumers were more likely to trust the innovative labelling approach compared to the static approach. Second, consumers who found the labels to be more useful, were also likely to have a higher expected intention to use.

The finding that consumers trust the innovative labelling approach more than the static labelling approach, is consistent with the observed mean scores of the *trust* variables for the meat category (see *figure 2*). The mean score of *trust* for the innovative labelling approach was slightly higher. Since trust has been found in earlier studies to be an important factor for successful (organic) labelling (Daugbjerg et al., 2014; Konuk, 2018; Tonkin et al., 2015), the higher perceived trust in the innovative labelling approach might indicate that the innovative labelling approach will be successful.

Age was found to positively moderate the effect of labelling approach on *trust.* This means that age affects the strength of the relation between the innovative labelling approach and *trust,* which showed to be significantly higher than the relation between the static labelling approach and *trust.* Further analysis showed that, for both labels, people of higher age generally gave a higher score on the *trust* items. This was not expected based on the literature on technology acceptance (Hosseini et al., 2015; Venkatesh et al., 2012) and some literature on organic labelling (Govindasamy & Italia, 1999). Nevertheless, the effect might be explained by looking at other demographic variables. Govindasamy and Italia (1999) reasoned that, as people become older, incomes eventually start to lower which may cause a lower willingness to pay for organic produce. However, the mean age of the consumers was quite low at around 25. The oldest consumer was 66 years old and, based on his income level, not yet retired. Incomes tend to rise with age with a peak for Dutch inhabitants at 40 years of age (Menger & Nieuweboer, 2019). Seeing as increasing income is positively related to organic food consumption (Torjusen et al., 2001), it makes sense that, for this sample, consumers older than 26 are more likely to buy organic products, which may have led to a more positive perception of the labelling approaches compared to younger consumers.

The variables income and education did not have any significant moderation effect. An explanation for this may be that the responses on both variables were quite one-sided, as around 75% of consumers were still in education. Moreover, around 20% of consumers decided not to answer to the question about their income. The female gender did not moderate the effect of labelling approach on the perception measures either. This was unexpected, as women have been found to pay more attention to health and environment (Irianto, 2015). However, in several studies women's likeliness to consume organic is related to the higher responsibility taken by women for feeding children (Lockie et al., 2002) and their role as primary food shoppers in many households (Boaitey & Minegishi, 2020). Since the majority of consumers was still in education and younger than 25 years old, these reasons may not be as relevant as in general.

The variables knowledge and product category did not have a significant moderation effect either. With regards to knowledge, an explanation might be that the labelling information given in the survey was quite limited. Knowledgeable consumers may have expected more detailed information from the innovative labelling approach. With regards to the product category, the stronger emotional effect that meat products can have compared to heavier processed products, may be lower than normal seeing as the share of (relatively knowledgeable) Wageningen students and graduates in the survey is expected to be relatively high.

The other three measures for perception, *ease-of-use, usefulness* and *understanding,* did not have significantly differing values between the two labelling approaches. This means that, with regards to

this questionnaire and sample, there is no proof that the innovative labelling approach provides significant improvements on these constructs in comparison to the static labelling approach.

With regards to the variable *understanding,* the mean scores were higher for the innovative labelling approach (see *figure 2*). Thus, while no significant effect was found, the innovative labelling approach at least does not seem to be harder to understand than the static labelling approach. Previous research found that clear and concise labels are more likely to be understood by consumers (Golan et al., 2001). The lack of a significant result may be explained by the fact that the presentation of the innovative labelling approach was accompanied by quite a lot more information compared to the static labelling approach, and may therefore be considered less concise by consumers compared to the static labelling approach.

According to the definition of Davis et al. (1989), The non-significant result for *ease-of-use* means that the degree to which consumers believe the innovative labelling approach to be free of effort is not significantly bigger than for the static labelling approach. Nevertheless, the mean score on *ease-of-use* was higher with regards to the innovative labelling approach, without reaching the significance threshold of $p < 0.1$. This implies that there are no significant differences between both labelling approaches. Thus, the innovative labelling approach does not appear to require more effort to use than a static labelling approach. This is valuable information since consumers will be required to accept the technological part of the innovative labelling approach in order to start using it.

The TAM hypothesizes that *perceived ease-of-use* together with external variables will have an effect on *perceived usefulness* (Davis et al., 1989). However, no significant effect was found in this study. Moreover, the mean scores in *figure 2* on *ease-of-use* are slightly higher for the innovative labelling approach, which is not the case for *usefulness.* This may imply that there are certain unknown external variables that played a role. These may be important as they can provide points of attention on which the innovative labelling approach could be improved. Relevant examples of such external variables mentioned in literature are subjective norms, enjoyment and self-efficacy (Abdullah, Ward, & Ahmed, 2016).

With regards to the multiple regression analysis, three measures of perception were not found to significantly predict the *intention to use: ease-of-use, understanding* and *trust.* Although in previous research, *ease-of-use* was found to positively relate to *intention to use*, this relation is not found in the TAM. As mentioned before, *perceived ease-of-use* together with external variables is hypothesized to predict *perceived usefulness* (Davis et al., 1989). The finding that *understanding* did not significantly predict *intention to use*, implies that consumers who intended to use the innovative labelling approach did not necessarily understand the approach better. This may be explained by the relatively high mean scores on *understanding* (see *figure 2*), implying that both labelling approaches were quite well understood by most consumers. The finding that *trust* as well did not significantly predict *intention to use*, was not expected based on literature (Lean et al., 2009). This may have been caused by a low score on *intention to use* for the innovative labelling approach, as the mean score on *trust* was significantly higher for the innovative labelling approach compared to the static labelling approach.

Usefulness was found to be a significant predictor for *intention to use*, which is the second main finding. This is consistent with previous research related to technology acceptance (Lean et al., 2009; Shin et al., 2012). It makes sense, as *perceived usefulness* is one of the main determinants of technology acceptance according to the TAM (Davis et al., 1989). Additionally, the TAM hypothesizes a direct relationship between *perceived usefulness* and behavioural intention to use (Davis et al., 1989). However, the finding may not be so much related to the acceptance of technology. The extent to which *usefulness* could predict *intention to use* did not differ much between the two labelling approaches. Hence, the construct *usefulness* may be of importance for animal welfare labelling in general. A

possible reason for the comparable effect of *usefulness* on both labelling approaches is the low mean age of the participants in the study. As young people are often more acquainted with technology (Hosseini et al., 2015), to them the difference between the static and the innovative labelling approach may be relatively small.

6 Implications

The main findings of this study offer useful insights inside and outside of the animal welfare labelling context. The finding that consumers trust the innovative labelling approach more than the static labelling approach, may be explained by the notion that the innovative labelling approach improves trust in more ways than the static labelling approach does. Tonkin et al. (2015) distinguish two forms of trust with regards to labelling: trust *in* food labelling and trust in the wider food system *through* food labelling. The innovative labelling approach gives consumers the chance to base their decisions on their own preferences and the criteria of organisations that they trust. As the credibility of the overseeing organisation has been linked to trust in certification labels (Sirieix, Delanchy, Remaud, Zepeda, & Gurviez, 2013) the innovative labelling approach might evoke a higher level of trust not only in the label itself, but also in the wider food system. Hence, a labelling system that lets consumers choose *whom* to trust, may improve consumers' trust overall. This consideration may also be useful in other contexts in which the interaction with consumers plays a role.

A valuable insight is the importance of *usefulness* for the intention to use a labelling approach. This insight gains more practical relevance when the definition of Davis et al. (1989) is taken into consideration. Davis et al. (1989) defined *perceived usefulness* as "the prospective user's subjective probability that using a specific application system will increase his or her job performance within an organizational context". Based on this definition, *usefulness* in the context of animal welfare labelling would be about increasing performance within a shopping environment. For both labelling approaches, one could think of improvements like better readability so that consumers can make their choice faster, or access to more complete information so that the made choice better fits the consumers' preferences. Additionally, the validated scale of *usefulness* adapted from Hilken et al. (2017) mentions "enhancing effectiveness" and "performance in evaluating products during shopping", next to the label being "useful". If a successful label is defined as a label that consumers intend to use, the findings at least imply that: (i) a successful label should enhance the effectiveness of shopping; (ii) a successful label should increase performance regarding the evaluation of products during shopping. These insights may be of use in a broader labelling context as well.

7 Limitations and Future Research Suggestions

There are some limitations related to this study that should be mentioned. First, at the start of the analysis only 54 consumers completed the questionnaire. A subsequent analysis that takes more responses into account may offer different results and additional information. Second, at the moment of data extraction there were around 40 unfinished responses. This may imply that the questionnaire was long, complex or both. A considerable part of the data has not been analysed in this study, but is expected to be of great use in follow-up studies. However, the results for this particular study might have been of a higher quality if only the questions relevant to this study were incorporated in the questionnaire. Third, a relatively large part of the responding consumers is expected to consist of Wageningen University students, who are generally considered more knowledgeable about and involved with animal welfare compared to the general population. Therefore, the generalizability of the results can be questioned.

In future research on perception of the innovative labelling approach, it may be useful to consider additional ways to present the approach to consumers.
Consumers' *understanding* of the innovative labelling approach may be improved by looking back at the explored literature. According to Grunert et al. (2014) *understanding* depends on consumers' motivation as well as on the labels' information. First of all, this implies that the explanation of what the innovative labelling approach offers could have been improved, or can be improved in follow-up research or implementations. Second, as mentioned above, the questionnaire may have been too long, causing consumers to lose motivation. This may have decreased the extent to which they understood the innovative labelling approach, as highly motivated consumers will put more effort into understanding a label (Grunert et al., 2014).

The most important construct to focus on in follow-up research is *usefulness.* According to this study, the innovative labelling approach did not provide improvements in this area. This result implies that the innovative labelling approach is not regarded as more useful compared to the static labelling approach. However, this result may have been different if the innovative approach was presented differently. The chatbot example mostly highlighted the increased access to more complete information. It may not have convincingly communicated the ease and speed with which choices can be made using the innovative approach. To achieve this, maybe other examples of technology should have been presented, like QR codes on products and a phone application to save preferences. Follow-up research in which other approaches are presented also allow for a potentially valuable comparison.

Finally, future research may benefit from taking other potentially important variables into account, such as subjective norm. While Davis et al. (1989) omitted this variable in the TAM, it has often been explored as extension on the TAM (Abdullah et al., 2016) and has been related to purchase intentions of organic produce before (Teng & Wang, 2015).

8 Conclusion

In conclusion, the research findings show that consumers perceived the innovative labelling approach more positively on specific constructs compared to the static labelling approach. More precisely, significant differences in the perception of the labelling approach were found for the variable *trust.* No significant differences were found for the other three variables that measured consumer perception. Furthermore, the findings show that *usefulness* was a significant predictor of consumers' *intention to use.* None of the other variables that measured consumer perception were found to be significant predictors. From the measured moderating variables, only *age* was found to significantly moderate the main effect of labelling approach on *trust.* This moderation effect was found to be positive.

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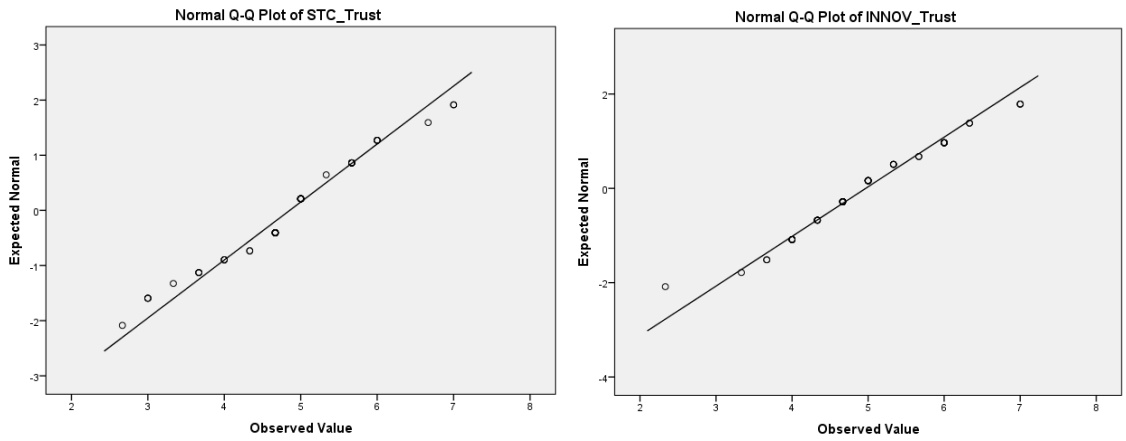
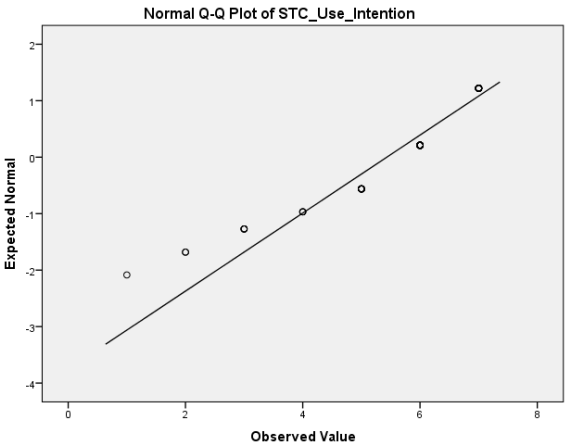
Appendix A

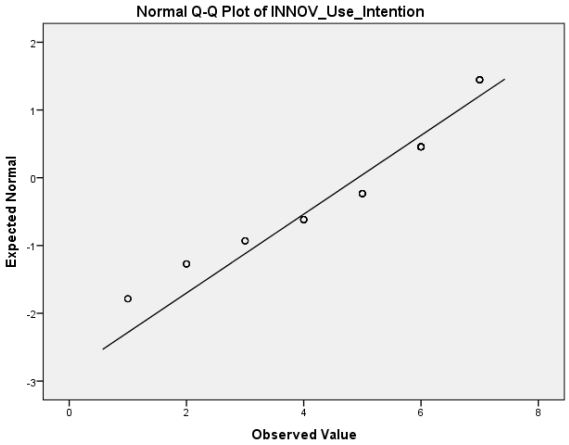
Overview of the scales that have been used in the survey. The wording of some of the scales has been slightly adapted based on the labelling approach the scale related to.

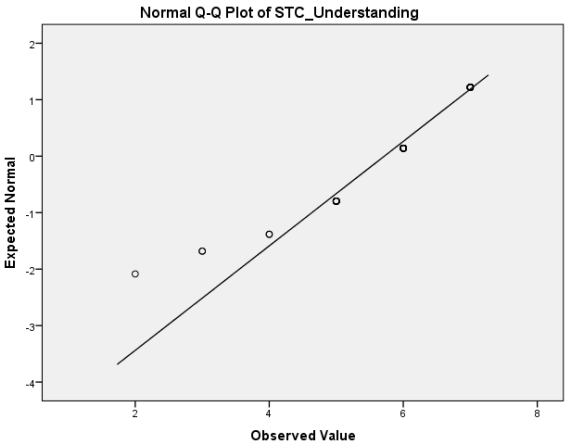
VARIABLE	ITEM #1	ITEM #2	ITEM #3	ITEM #4
TRUST NOT AT ALL (1) – VERY MUCH (7)	How much do you think you could count on the shared decision-making system?	How much do you think you would trust the shared decision-making system?	How dependable do you think the shared decision-making system would be?	
USEFULNESS STRONGLY DISAGREE (1) – STRONGLY AGREE (7)	Using the app would improve my performance in evaluating the products during online shopping.	I would find the app to be useful for online shopping.	Using the app would enhance my effectiveness in online shopping.	
EASE-OF-USE STRONGLY DISAGREE (1) – STRONGLY AGREE (7)	I believe that my interaction with this technology would be clear and understandable	It would be easy for me to become skilful in using this technology.	I would find this technology easy to use.	
UNDERSTANDING STRONGLY DISAGREE (1) – STRONGLY AGREE (7)	The information provided in the chatbot was easy to understand.			
INTENTION TO USE STRONGLY DISAGREE (1) – STRONGLY AGREE (7)	I would choose to buy animal based products with the support of the shared decision-making system to have more guarantees on animal welfare in farming			
KNOWLEDGE ITEM #1-2: NOT AT ALL (1) – EXTREMELY (7) ITEM #3: VERY LITTLE (1) – A LOT (7) ITEM #4: ONE OF THE LEAST KNOWLEDGEABLE (1) ONE OF THE MOST KNOWLEDGEABLE (7)	How familiar are you with animal welfare standards?	How clear of an idea do you have about which animal welfare standards are important for providing you with maximum satisfaction when you choose animal based products?	How much do you know about animal welfare standards?	How would you rate your knowledge about animal welfare standards relative to the rest of the population?

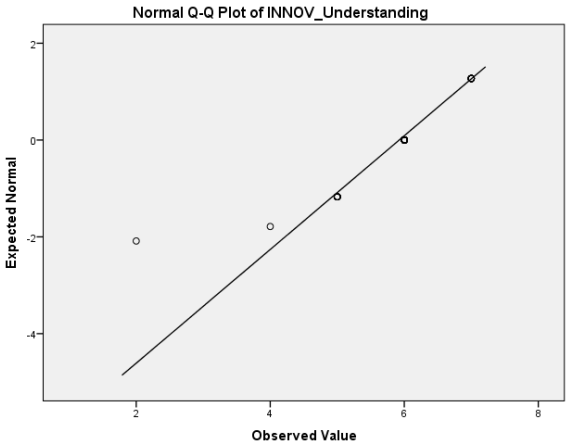
Appendix B

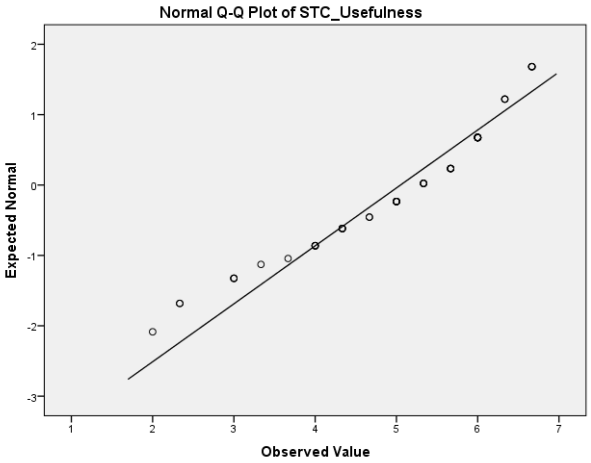


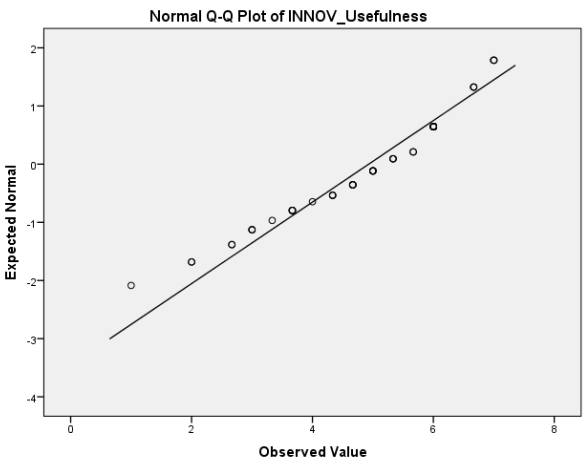

Normal Q-Q Plot of STC_Use_Intention
Expected Normal
Observed Value

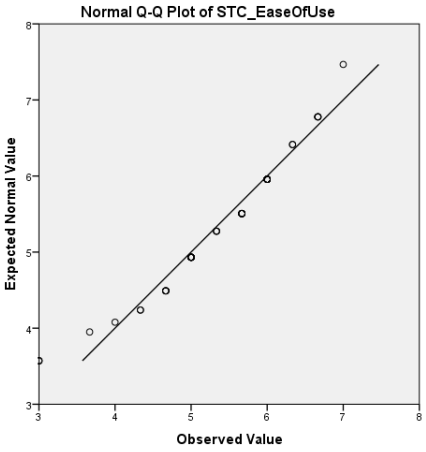

Normal Q-Q Plot of INNOV_Use_Intention
Expected Normal
Observed Value

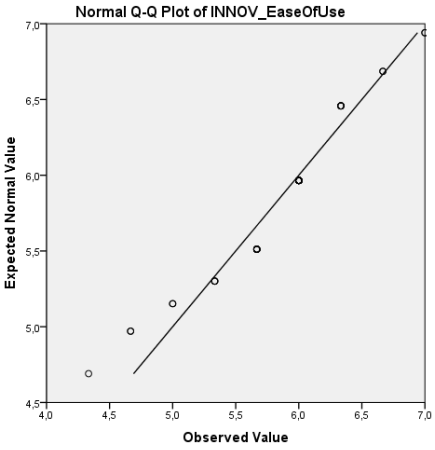

Normal Q-Q Plot of STC_Understanding
Expected Normal
Observed Value


Normal Q-Q Plot of INNOV_Understanding
Expected Normal
Observed Value


Normal Q-Q Plot of STC_Usefulness
Expected Normal
Observed Value


Normal Q-Q Plot of INNOV_Usefulness
Expected Normal
Observed Value





Appendix C

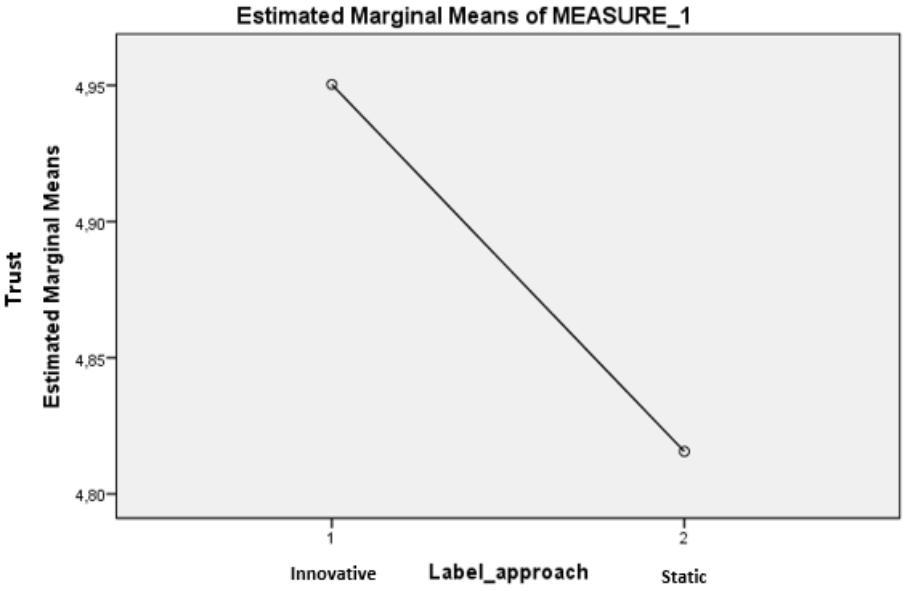
Repeated-measures MANCOVA - Trust

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Label_Approach	Pillai's Trace	,088	3,846[b]	1,000	40,000	,057	,088
	Wilks' Lambda	,912	3,846[b]	1,000	40,000	,057	,088
	Hotelling's Trace	,096	3,846[b]	1,000	40,000	,057	,088
	Roy's Largest Root	,096	3,846[b]	1,000	40,000	,057	,088
Label_Approach * Age_1	Pillai's Trace	,162	7,740[b]	1,000	40,000	,008	,162
	Wilks' Lambda	,838	7,740[b]	1,000	40,000	,008	,162
	Hotelling's Trace	,194	7,740[b]	1,000	40,000	,008	,162
	Roy's Largest Root	,194	7,740[b]	1,000	40,000	,008	,162
Label_Approach * Gender	Pillai's Trace	,060	2,555[b]	1,000	40,000	,118	,060
	Wilks' Lambda	,940	2,555[b]	1,000	40,000	,118	,060
	Hotelling's Trace	,064	2,555[b]	1,000	40,000	,118	,060
	Roy's Largest Root	,064	2,555[b]	1,000	40,000	,118	,060
Label_Approach * Education	Pillai's Trace	,022	,880[b]	1,000	40,000	,354	,022
	Wilks' Lambda	,978	,880[b]	1,000	40,000	,354	,022
	Hotelling's Trace	,022	,880[b]	1,000	40,000	,354	,022
	Roy's Largest Root	,022	,880[b]	1,000	40,000	,354	,022
Label_Approach * Income	Pillai's Trace	,000	,012[b]	1,000	40,000	,912	,000
	Wilks' Lambda	1,000	,012[b]	1,000	40,000	,912	,000
	Hotelling's Trace	,000	,012[b]	1,000	40,000	,912	,000
	Roy's Largest Root	,000	,012[b]	1,000	40,000	,912	,000
Label_Approach * Knowledge	Pillai's Trace	,032	1,305[b]	1,000	40,000	,260	,032
	Wilks' Lambda	,968	1,305[b]	1,000	40,000	,260	,032
	Hotelling's Trace	,033	1,305[b]	1,000	40,000	,260	,032
	Roy's Largest Root	,033	1,305[b]	1,000	40,000	,260	,032
Label_Approach * Product_category	Pillai's Trace	,017	,711[b]	1,000	40,000	,404	,017
	Wilks' Lambda	,983	,711[b]	1,000	40,000	,404	,017
	Hotelling's Trace	,018	,711[b]	1,000	40,000	,404	,017
	Roy's Largest Root	,018	,711[b]	1,000	40,000	,404	,017

a. Design: Intercept + Age_1 + Gender + Education + Income + Knowledge + Product_category
Within Subjects Design: Label_Approach

b. Exact statistic



Covariates appearing in the model are evaluated at the following values: What is your gender? = 1,49, Please indicate your education level. = 2,87, Please select your monthly net household income (the sum of incomes of all household members): = 2,94, Knowledge = 3,5000, What is your age? - Please move the slider to indicate your age. = 25,0638, Product_category = 1,55

Appendix D

D1 Multiple regression – Static labelling approach

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	,664[a]	,440	,387	1,00440	,440	8,260	4	42	,000

a. Predictors: (Constant), STC_Usefulness, STC_Understanding, STC_Trust, STC_EaseOfUse

b. Dependent Variable: STC_Use_Intention

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	33,332	4	8,333	8,260	,000[b]
	Residual	42,371	42	1,009		
	Total	75,702	46			

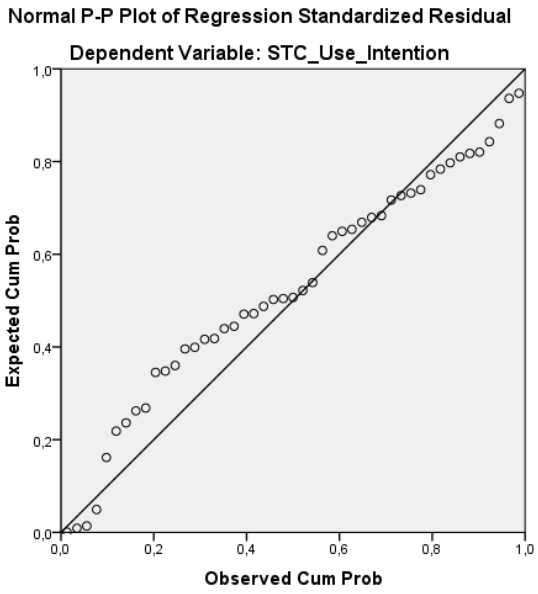
a. Dependent Variable: STC_Use_Intention

b. Predictors: (Constant), STC_Usefulness, STC_Understanding, STC_Trust, STC_EaseOfUse

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations		
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part
1	(Constant)	1,797	1,149		1,564	,125			
	STC_Trust	-,292	,195	-,196	-1,501	,141	,060	-,226	-,173
	STC_Understanding	,069	,156	,058	,445	,658	,113	,069	,051
	STC_EaseOfUse	,142	,183	,107	,773	,444	,231	,118	,089
	STC_Usefulness	,764	,142	,661	5,375	,000	,637	,638	,621

a. Dependent Variable: STC_Use_Intention



D2 Multiple regression – Innovative labelling approach

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	,546[a]	,298	,231	1,33370	,298	4,464	4	42	,004

a. Predictors: (Constant), INNOV_Understanding, INNOV_Usefulness, INNOV_Trust, INNOV_EaseOfUse

b. Dependent Variable: INNOV_Use_Intention

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	31,760	4	7,940	4,464	,004[b]
	Residual	74,708	42	1,779		
	Total	106,468	46			

a. Dependent Variable: INNOV_Use_Intention

b. Predictors: (Constant), INNOV_Understanding, INNOV_Usefulness, INNOV_Trust, INNOV_EaseOfUse

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			Correlations		
		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part
1	(Constant)	4,113	2,664		1,544	,130			
	INNOV_Trust	-,087	,256	-,055	-,341	,735	,222	-,052	-,044
	INNOV_Usefulness	,785	,219	,640	3,577	,001	,531	,483	,462
	INNOV_EaseOfUse	-,325	,495	-,114	-,656	,516	,247	-,101	-,085
	INNOV_Understanding	-,104	,379	-,039	-,275	,785	,028	-,042	-,036

a. Dependent Variable: INNOV_Use_Intention