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# Transparency in Meat Production – Consumer Perception at the Point of Sale

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# Transparency in Meat Production – Consumer Perception at the Point of Sale

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*Abstract*— As a result of a large number of food scandals, societal interest in transparency in the food sector has grown considerably. Deficits have been discovered, which new legal frameworks of the EU and the German legislative body have attempted to address. Hence, the creation of transparency in the production process has been the focus of the legislation. In this context, traceability systems for animal-based foods, for instance, have been established (Regulation (EC) 178/2002). In addition to tracking and tracing, one finds in the public discussion an increasing number of demands for further information, for instance information on food safety, animal and environmental protection and generally for sustainability of the production processes for foods. This is intended as a response to the general call for more transparency or a "gläserne Produktion".

It has not been sufficiently clarified which information about the production process, and thus which level of transparency is actually desired, or can actually be processed, by consumers at the point of sale. This is related to the question of to what extent the demands for more transparency in meat production are influenced by new campaigns of many consumer organisations and NGOs, or whether these actually represent user preferences at the point of sale.

In order to analyse this topic from the viewpoint of the consumer, a large-scale empirical study has been conducted. This is intended to determine what transparency expectations, in the form of information on packaged pork, consumers have, using an adaptive conjoint analysis.

*Keywords*— Transparency, pork production, adaptive conjoint analysis.

## I. INTRODUCTION

In the past few years, questions about the transparency of food supply chains have gained increased relevance due to a large number of past crises in the agribusiness. As a consequence, the European Union has passed legal norms concerning

for example the traceability of food and feedstuffs, which are intended to establish more transparency in the production processes (Regulation (EC) 178/2002) [1]. In addition to tracking and tracing, which Hofstede [2] calls "historical transparency", there is an increasing demand in public discourse for further-reaching information—for instance about food safety, animal and environmental protection and generally for sustainability in the food production process [3].

Studies from the past several years show that meat products and their production receive very low levels of consumer trust [4, 5]. For this reason, there have been a variety of economic and academic initiatives in the past several years aimed at raising consumer trust through traceability systems, certifications and quality labels. This is intended to address the general desire for more transparency in the sense of the much-demanded "gläserne Produktion" (transparency in the production process) [6]. But it remains to be clarified what sort of information about the production process, and thus what degree of transparency, the consumer actually desires and can comprehend [7]. It is also relevant to determine the extent to which the demand for more transparency in meat production has been influenced by recent campaigns by a number of consumer organisations and NGO's, as opposed to actual consumer preferences at the point of sale.

In order to approach this question, results of a consumer survey will be presented, and, using a computer-supported Adaptive Conjoint Analysis (ACA), transparency perceptions while purchasing fresh packaged pork will be analysed. The choice of an adaptive version of Conjoint Analysis allows to operationalize the multi-faceted construct "transparency", based on a large number of attributes and attribute levels (for example animal origin, feedstuffs or the upholding of environmental standards). Additionally, this method allows to determine which areas of the production process the consumer finds transparency important in, and what

amount of transparency is actually of use to the consumer.

Empirical findings concerning consumer perception of transparency at the point of purchase are most interesting for producing firms. This is because possible transparency initiatives take effect almost exclusively at the point of sale, for instance through increased sales or an increased consumer willingness to pay more. The results can also give valuable information concerning the extent to which transparency can be used for market orientation of firms [8] or the improvement of quality-assurance systems [9, 10].

## II. CURRENT DISCUSSION

### A. Transparency: An attempt to define the concept

The concept of transparency can be found in a wide variety of research fields. In common speech the concept is associated with visibility, specificity, understandability, recognizability and clarity [11, 12]. “Clarity” is for instance evident when an prominent idea is consciously and clearly, rather than vaguely formulated [13]. In spite of the basic agreement concerning the definition of transparency, there are several discipline-specific nuances in academic research [14]. In physics, for instance, the concept refers to light permeability in materials [12]. In economics, transparency is a fundamental aspect of a functioning market. Transparency refers to the complete and detailed overview of all market conditions, prices, products, etc, which must be accessible for all market participants simultaneously [15]. Sociologists associate transparency with the process of actively acquiring information, undertaken by individuals. They identify transparency as a main motivating factor in human behavior, utilized in order to gain orientation in a complex environment [16, 17].

If the goal is to operationalize the latent construct “transparency”, these definitions are not very helpful. Transparency can only then be measured through an acquisition and processing of information, leading to a change in the knowledge state of the recipient. For the purposes of operationalization, transparency can be equated with an increase in information [14, 18, 19]. Transparency is generated through a complicated

interplay of actors who create transparency (or an increase in information) and actors who perceive the information that is asked for. Communication processes ideally serves as a balance between information supply and information demand. Lack of transparency arises via failed, insufficient and non-existent communication processes [14, 18].

### B. Transparency in agribusiness

If one observes the present social discourse, one will find an increasing demand for more transparency, especially in the area of food products of animal origin. This demand has been addressed by numerous food laws [20-22]. Topics like traceability, as an instrument for the improvement of “historical transparency”, and transparency in the “Business to Business” (B2B) relation have been the focus of these laws [2]. The latter includes elements like inter-firm communication and entrepreneurial participation in complex value-adding networks. In this context, operative and strategical transparency are differentiated [2, 23]. Operative transparency is understood as the result of a a common, inter-firm planning of daily activities (e.g. logistics). Strategical transparency refers to future-oriented, reciprocal information flow between firms (e.g. shared product and process innovations). The three different concepts of historical, operative and strategic transparency have in common that they refer to the degree of shared understanding or access to product information that is desired by all participants of a value-adding chain [2, 23]. In addition to Hofstede [2], also the transparent design of production processes can be understood as part of historical transparency besides traceability.

In order to create more transparency in agribusiness and especially in the area of food production, various attempts have been undertaken. In the area of historical transparency, wide-reaching, inter-firm traceability systems have been developed in the past few years [24]. All precautions involving additional oversight are intended to indirectly have a positive effect on consumer trust, through a reduced risk of incidence. However, transparent and understandable communication of such precautions directed at the consumer could strengthen this effect [25]. Attempts at transparent communication of processes and goals have been made using quality- and “ecological”

(“Öko”) seals, as well as recently using the “ecological balance method” (Ökobilanzmethode) [26-28].

### C. Transparency in consumer communication

This paper focuses on transparency of products on the micro-level in the “Business to Consumer” (B2C) relationship (see Figure 1). Transparency includes on the one hand product transparency, which refers to all legally guided labelling possibilities, such as norms, certification, seals of quality or ingredient information. These factors, in addition to pricing and brand or producer names, provide fundamental information about the goods [29-31]. On the other hand the following study will explicitly take into account the transparency of production processes, for instance information about feedstuffs utilized or the upholding of standards concerning animal welfare or the environment in pork production. The focus of the analysis will be perceptions of transparency by the consumer at the point of sale.

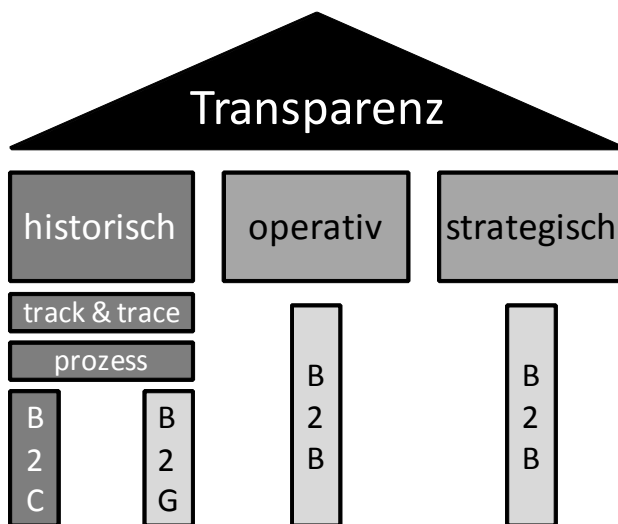


Fig. 1: Stakeholders and dimensions of transparency.

The consumer's need for additional transparency is partly attributable to his/her insecurity [5, 32, 33]. Reasons for this include the satiation phenomenon, alienation from the production process and a fundamental drop in trust in the affluent society [25]. The satiation phenomenon, caused by low prices and high availability of foods, can be seen in a contempt that is often associated with the false assumption that

falling prices imply a drop in quality [32]. The second reason cited above involves the alienation of the consumer from the production, processing and preparation of foods products. Reasons for this are the largely complex value-adding chains and the strong division of labor in the food-producing branch [5]. The substantial drop in fundamental trust involves political, administrative and scientific institutions [34, 35]. This effect is so far-reaching that scientific studies involving food safety are met with an increasing amount of distrust [5, 33].

Through market variety and-especially in the area of food products-product differentiation and diversification, the market transparency for consumers is often reduced. In order to address this deficiency in the buying situation, the consumer's need for information rises, since more information can raise transparency [36]. The level of need for information, and thus also the level of transparency, depends on the one hand on the individual's cognitive and social abilities, and on the other hand on availability of time and finances [32].

There are a number of voluntary firm and government initiatives in the market, for instance QS, Tested Quality Bavaria, whose goal is the formation of transparent production processes in the entire value-adding chain, under the motto “from farm to fork”. Food producers have also reacted, introducing their own seals of quality, for instance premium brand meat programs. This is intended to meet the demands of the EU, government and consumer protection groups and first of all the consumers themselves. But with this large number of seals, it has become difficult for consumers to process this flood of data at the point of sale [37]. This massive number of various private food labels of the sellers was summarized by the CIAA (Confédération des industries agro-alimentaires de l'UE, 1999). Already in 1999, it was clear that such a variety of information cannot be transparently communicated on packaging. Despite the inclusion of important information for the consumer, like contents, nutritional information and dangers, information about production processes are rarely communicated [38]. This is on the one hand a transparency problem, and on the other hand a problem of information overload.

Solutions for the overfilling of limited packaging surface might include information campaigns (with a

basis in IT science), information understandable to the user as well as standardized symbols and quality seals. Concerning these problems, transparency at the point of sale must be analysed in a more detailed manner [38-40].

### III. METHODS AND GOALS

The goal of this work is to analyse the transparency expectations and perceptions of the consumer at the point of sale for packaged pork purchased from self-service areas, utilizing an empirical survey.

A condition for the analysis of transparency is that it can be operationalised. This work will attempt to operationalise the degree of transparency by information about various product attributes and their attribute levels [14, 18, 19]. During this analysis, the assumption will be made that an increased degree of detailed informations about a certain attribute is associated with an increased degree of transparency for that attribute.

In the course of this study, consumers aged 18+ were surveyed in August 2010, using an online questionnaire. The operationalisation of the concept „transparency“ described above was implemented in the survey in two blocks. In one block the consumer was asked about his/her perception of transparency by asking about his/her position with regard to topics like insecurity, risk assessment, quality, price perception and attitude concerning ethics and the environment (statement batteries). This block mostly utilized 7-part Likert Scales. A second block contained an ACA. In the ACA, the consumer was placed in a buying situation for packaged grill-pork, located in a self-service area. The ACA block was intentionally placed before the block with the attitude questions (statement batteries), in order to avoid steering the test-subjects toward the relevant topics before the fictitious buying situation in the ACA. This allowed us to simulate the meat-buying situation realistically, with the appropriate level of involvement. The product group

„grill-meat“ was chosen because it was fitting for the month of August, during which the survey was conducted. Another reason for the choice was that grill-meat is a well-known product that many consumers have dealt with in buying situations in the past. Using a well-known product made it easier to get the test-subjects to realistically imagine themselves in a buying situation. The test-subjects were offered the chance to buy various fictitious products with various combinations of attribute levels on the computer. A total of two transparency attributes with three attribute levels each, and seven attributes with four levels each were used (see Table 1). The choice of relevant attributes and their levels focused largely on attributes that are connected with the production process. The construction of the survey was undertaken using research on existing initiatives that dealt with the signalisation of transparency, for example for name-brand pork programs, regional brands or programs involving natural/organic production. Additionally, the approaches taken by previous scientific studies were taken into account [41, 42]. Current claims made by consumer protection institutions were also integrated. Table 1 displays attributes concerning product traceability and the origin of the animal, which have been the subject of discussions in the past few years. In order to take into account the problems associated with GMOs, attribute levels were included concerning the use of feedstuffs. The conjoint-design also includes the most recent issues in the transparency debate, namely, animal welfare and environmental concerns involving for instance the carbon footprint of the production process. The increments utilized for the price attribute were the result of average prices of three buying venues from each of the two categories „Hard Discounter“ (Ø 4.75 €/Kg) und „Supermarket“ (Ø 6.87 €/Kg) for three different brands of meat products (Ø 9.50 €/Kg) and three meat products adhering to the EU rules for organic products (Ø 13.66 €/Kg) (Store check on 15. June 2010).

Table 1: Attributes and attribute levels of the Adaptive Conjoint Model.

Attributes	Attribute Levels	Attributes	Attribute Levels
<b>Price</b>	4,75 €/Kg	<b>Brand</b>	Hofglück Markenfleisch
	6,87 €/Kg		Kommeyer Fleischwaren
	9,50 €/Kg		gut&preiswert
	13,66 €/Kg		no brand
<b>Animal origin</b>	from the local region	<b>Animal slaughter</b>	in the local region
	from Germany		in Germany
	from Europe		in Europe
	no information		no information
<b>Food safety</b>	QS-Ihr Prüfsystem für Lebensmittel!		
	from controlled production		
	no information		
<b>Producer Information</b>	names of all involved firms (e.g. packers, processors, slaughterhouse, farmer)		
	name of farmer and slaughterhouse		
	name of one involved producer only		
	no producer name given		
<b>Animal feeding</b>	farm-internal and regional feedstuffs are used		
	no addition of genetically-modified feedstuffs or feedstuff additives		
	use of feedstuffs strictly according to legal restrictions		
	no information on feedstuffs used		
<b>Animal Husbandry</b>	reduced number of animals per stall, with straw bed		
	reduced number of animals per stall		
	strictly according to legal restrictions		
	no information		
<b>Environmental standards in production</b>	upholding of environmental standards in production above and beyond legal restrictions		
	strict adherence to legal environmental standards in production		
	no information on upholding of environmental standards in production		

The buying decisions made by the consumers were used to determine the individual importance of transparency attributes and the individual utility of information on attribute levels.

#### IV. RESULTS

In the above-mentioned study, 849 consumers were surveyed. Using data on age and gender from the German Bureau of Statistics, the representativeness of the survey was ensured.

In order to ensure high-quality results, 112 cases were eliminated for the descriptive analysis. In the first step, based on the variable „duration“, the respondents who took fewer than 10 minutes to fill out the entire survey were not included in the analysis. In the second step, outliers and cases of insufficient plausibility were manually sought out and eliminated.

In total, 737 cases were able to be used for the descriptive analysis.

##### A. Descriptive results

In order to characterize the sample, the following questions about the decider and the decision at the point of sale must be answered. In the survey, the decider could be identified 62.1% of the time. The question „Who is responsible for grocery shopping in your household?“ was answered 33.9% of the time with „just me“, 28.2% with „mostly me“, 28.4% with „sometimes me, sometimes someone else“ and 9.5% with „mostly someone else“.

Of the deciders, 94.6% have experience with meat from self-service areas, and for 27.3% of respondents, more than 2/3 of their general meat consumption is concentrated on packaged meat from self-service areas.

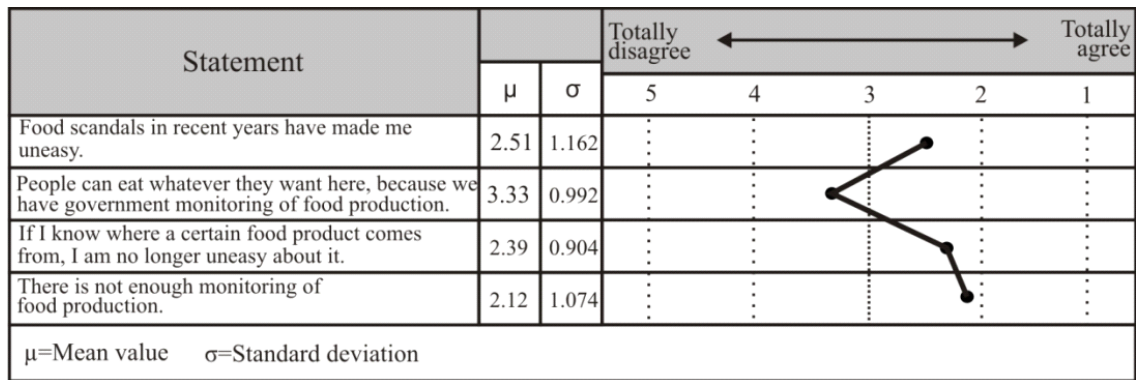


Fig. 2: Consumers' insecurity in terms of food safety.

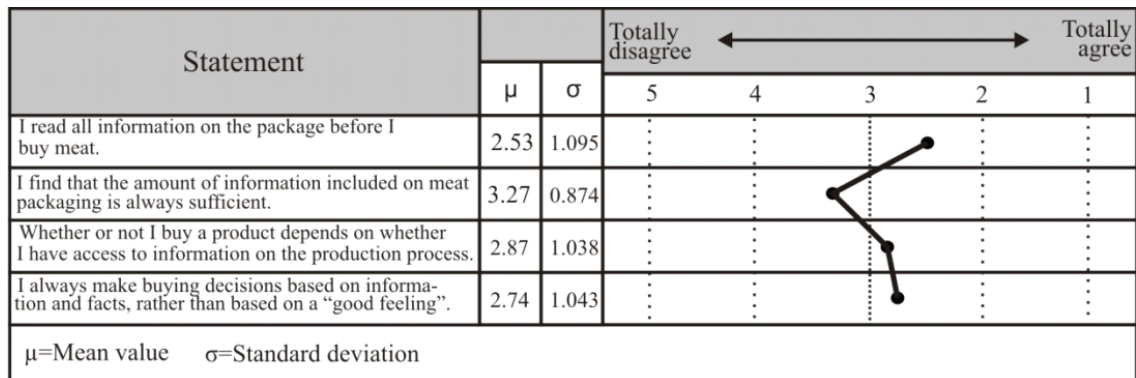


Fig. 3: Consumers' information seeking behavior.

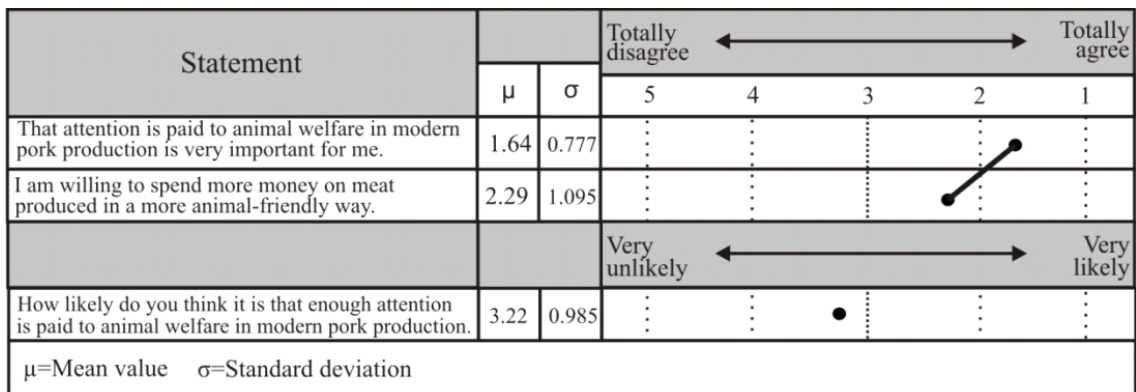


Fig. 4: Consumers' attitudes towards animal welfare.

Using a quota system, it was ensured that all respondents eat pork. A question asking how often fresh (non-frozen, non-sliced) pork was bought for their household revealed heterogeneous buying behavior: 49.5% buy fresh pork less than once a week and 42.1% once or twice per week.

For reasons of transparency, the presentation of meat in packaging is especially relevant. The survey

asked whether the consumers preferred unmarinated pork to marinated pork. The answers revealed that 28.5% preferred unmarinated pork, 34.1% marinated pork and 37.4% were undecided. After asking about buying habits related to marinated or unmarinated meat, the respondents were presented with the statement „I often have an uneasy feeling when dealing with marinated, processed meat, since I can't



directly see the quality of the product“, and asked to what extent they agreed. 30.5% agreed fully, 26.5% mostly agreed, 24.4% were undecided, 14.1% mostly disagreed and 4.5% completely disagreed.

The analysis of the statement batteries, which analysed the attitudes of the respondents with regard to food products in general and their purchasing of food products, shows a largely heterogeneous and partly inconsistent picture of consumers. Half of the respondents feel uneasy due to past food scandals (see Figure 2), and over 66% desired stronger food monitoring.

Thus, only 20% can confirm that government monitoring of food products means that one can eat whatever one wants in Germany without worry. 52% of the respondents indicated that quality and test seals on packaging give them a feeling of trust when it comes to food safety. The results in Figure 3 show the behavior of the respondents with regard to information at the point of sale.

Inconsistencies arose, for example, in that the majority of respondents said that the amount of information offered was not sufficient, but only 19% could clearly confirm that they read through all information on packaging before buying meat. Only 36% base their purchase on the information given about the production process (e.g. feedstuffs, animal husbandry, butchering). Around 70% could not clearly confirm that they feel well-informed about meat production. 83% of the respondents were of the opinion that there are large quality differences in meat products. But only 10% could clearly confirm that they always choose the best quality and do not pay attention to the price when purchasing meat. Nearly 31% of the respondents indicated that they only look at the lowest prices when buying meat.

Around 80% prefer, according to the survey, meat from the local region. More than half indicated that meat from the local region is of higher quality. With respect to the production process, 88% of consumers indicated that they found it important that attention is paid to animal protection in pig husbandry (see Figure 4). Over 62% lean toward a readiness to pay more money for especially meat produced with especially animal-friendly methods.

Whether these answers have been skewed by views of what is socially acceptable as an answer, and

whether these consumer attitudes are actually reflected in product purchases are some of the research points that are explored in the conjoint analysis.

### B. Adaptive conjoint analysis

After the description of the sample, the results of the adoptive conjoint analysis will be presented. The ACA is a further development of the hybrid conjoint method [43]. It is based on a computer-based data collection method-the following sample was collected using an online tool. The development of the ACA in the 1980's was a result of a need to describe complex services and products using multiple attributes and attribute levels [44]. This is intended to simulate a realistic decision-making process for the respondents [45]. The combination of compositional and decompositional parts of the ACA is intended to allow a presentation of products via several attributes and their levels, and guarantee a collection of realistic data. The respondent undergoes a total of five phases in the computer survey, with the first and fifth phases being optional [46]. The following Figure 5 illustrates the process involved in the ACA.

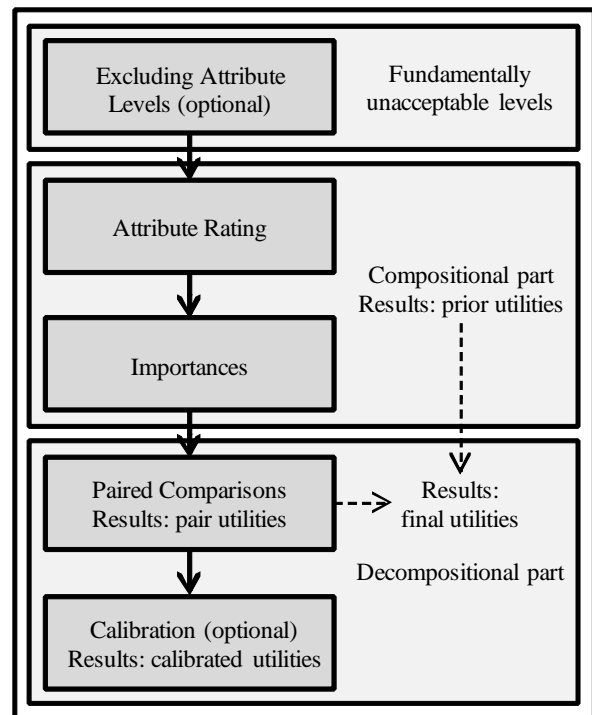


Fig. 5: Stages and results of an Adaptive Conjoint Analysis.

The survey conducted for this work does not use the first phase, the ruling out of attributes, because no criteria were used in the survey that would have led to an immediate rejection, such as "organic" or "conventional". This means that no attributes are included that are absolutely unacceptable for the respondents. The following two phases belong to the compositional part of the survey. In the second phase, the survey respondents must rate the general utility of each stimulus, either using a non-metric ranking system or a metric rating system [47]. The study conducted here used a metric rating system for reasons of simplicity for the respondents. In the following, third phase, the respondents are asked about importance, based on a comparison of the previously best- and worst- rated level of each attribute. During this phase the respondent is supposed to indicate how important the difference between these two levels is, based on a scale. After the end of the third phase, the individual prior utilities are calculated. These are then used in the construction of the product profile that the respondent must judge pair-wise in the next phase of the ACA interview. The fourth phase is the pair comparison phase. In this phase the respondent is presented with two products to judge, for which he should be indifferent based on previously provided prior utilities. This phase uses a seven-level rating scale for this. The number of pairwise comparisons is dependant on the design of the survey [48]. After each pairwise comparison, the approximate part-worth values (utility value of a attribute level) are successively corrected. This is done using an ordinary-least-square-regression and results in the pair utilities [49]. After the end of the fourth phase, the previous and pair utilities are combined to obtain the total utility (or utilities). The fifth and final, optional phase is intended to allow the calibration of the utility values determined in the first four phases. For this, the full profile of products is presented to the respondents [47], and they are asked to give a probability of purchase. This is intended to test the consistency of previously given preference indications. The survey is then again adjusted to fit the individual judgment behavior of the survey participants. This allows an assumption of a real analysis of individuals [50]. The final phase involves the calculation of individual calibrated utilities.

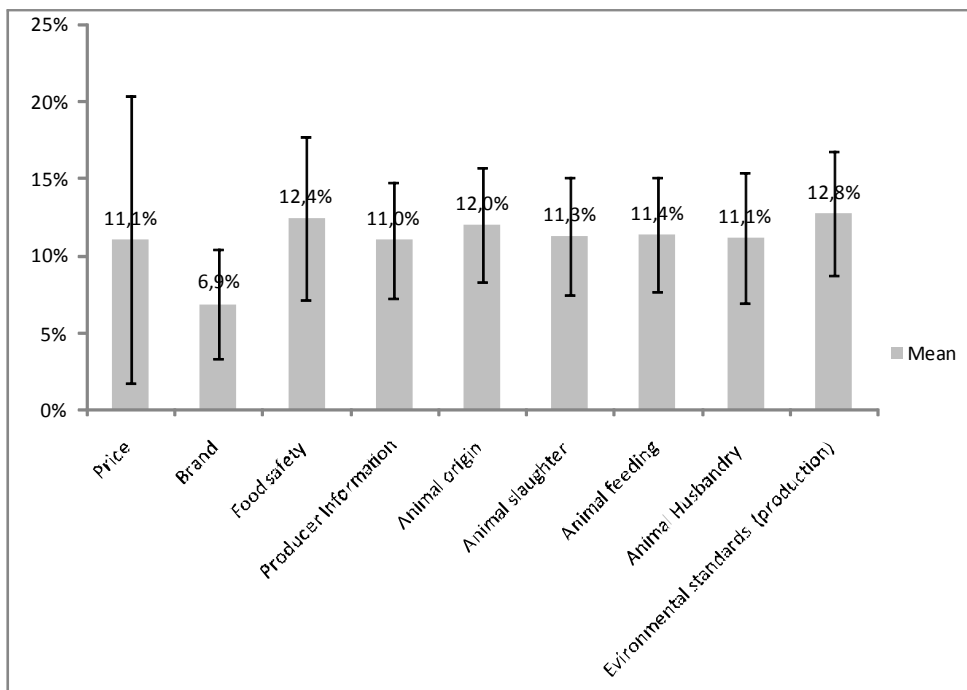
The data set with the calculated utility values must fulfill certain quality criteria before it can be analyzed. Because the ACA for packaged meat is intended for self-service buying areas, all 31 respondents who do not purchase self-service meat were excluded from the analysis. In addition to the cleanup methods mentioned above, an additional test of validity must be carried out. One must differentiate between external and internal validity [51]. External validity is fulfilled in representative research results [52]. Internal validity can be determined by the certainty measure  $R^2$  [49]. This measure concerns the regression between the final part-worth values and the purchase probabilities of the calibration phase. Using  $R^2$ , an additional 131 cases had to be eliminated in order to ensure the validity of the ACA. The quality criterium was set at  $R^2 \geq 0.5$  [46]. The fulfilling of this validity ensures the reliability of the analysis [53]. The remaining 575 cases now exhibit an average  $R^2$  of 0.7799. This indicates a high level of involvement in the remaining respondents, which is a good basis for high quality results [46].

After ensuring the quality of the research results, the data for analysis will be prepared on an aggregated level. The individual calibrated utilities, which are already available and not normed, are only suitable for analyses at an individual level [49]. If the data are aggregated for the entire sample, or used for comparison between individual values, then the utility values must be normed. This ensures that the part-worth values of all respondents are with respect to the same zero value and are based on the same scale. For the norming, the zero-centered-diffs method (see the following formula) was used, and not just the points method [54, 55].

$$\beta_{mj}^* = \frac{\left( \beta_{mj} - \frac{\sum_{l=1}^{L_m} \beta_{mlj}}{L_m} \right) * M * 100}{\sum_{m=1}^M \square}$$

with:

$J$  : Number of Test Subjects



$\beta_{mlj}^*$ : normed part – worth value for the  $l$  – th

attribute level of the  $m$ -th attribute for the  $j$ -th test

$\max_{l \in \{1, \dots, L_m\}} \{\beta_{mlj}\}$ : largest attribute level

of the  $m$ -th attribute for the  $j$ -th test subject

subject.

$\min_{l \in \{1, \dots, L_m\}} \{\beta_{mlj}\}$ : least-valued attribute level

of the  $m$ -th attribute for the  $j$ -th test subject

The aggregation of the zero-centered utility diffs is achieved via the calculation of the arithmetic mean over all 575 cases.

The following analysis of the conjoint blocks is divided into two sections. In the first step, the analysis of relative importance is used to judge the relevance of the 9 individual product attributes. Figure 6 shows the mean values of the aggregated relative importance for each attribute. The relative importance was calculated using the following formula:

$$W_m = \frac{\beta_{ml}^{\max} - \beta_{ml}^{\min}}{\sum_{m=1}^M (\beta_{ml}^{\max} - \beta_{ml}^{\min})}$$

Fig. 6: Attribute importance results.

$\beta_{mi}^{\min}$ : lowest part worth value of the attribute  $m$

with:

The formula shows that the relative importance of an attribute is calculated using the difference between the best and the worst-valued attribute level. The maximal utility span (difference) is set into relation to the maximal utility span of all 9 attributes.

$w_m$ : relative importance of the attribute  $m$

Since the summation of the relative importance results in 100%, a direct utility contribution of the attribute can be interpreted from each individual relative importance [46]. The aggregated percent values in Figure 6 show clearly that the attributes are largely of similar importance, though the attribute "environmental standards in production" is the most important attribute with around 13%. Also notable is the low relative importance of the attribute "brand", with just 7%. Although the attribute "price" unexpectedly is only of average importance, there is in that case a very large standard deviation. The same is true for the attribute food safety. This illustrates that there are heterogeneous preference structures in the total sample.

$\beta_{mi}^{\max}$ : highest part worth value of the attribute  $m$

In the second step, as described above, the calibrated standardised part-worth utilities of each level are aggregated for all subjects and their mean values are presented in Figure 7.

The Figure 7 shows at first glance that the attitude "brand" is perceived as the least important overall. It can be seen that the respondents are largely indifferent about brand-name meat programs (e.g. "Hofglück"), the producer brand ("Kornmeyer Fleischwaren) and the private label ("gut&günstig"). Only products without a brand are largely judged negatively. Figure 7 shows that in addition to the attribute price, all levels of all attributes regarding transparency of production processes were judged as expected. In other words, "no information" about the production process is judged to be purely negative. Apparently transparency, i.e. information about the production process, is of utility to the consumer. However, sometimes even imprecise and undifferentiated information like "from controlled production" or "strictly according to law"

were judged to be of clear use. This information suggests transparency, but require the respondent to possess knowledge about the legal restrictions involved in order to judge them properly. This even leads to a situation in which imprecise information about food safety "from controlled production" was judged more favorably than the quality seal of a certification system (QS-Ihr Prüfsystem für Lebensmittel!).

## CONCLUSION

In the course of the analysis of consumer attitudes and transparency perception concerning food, the responses to statements showed a clear uneasiness of the respondents with regard to food safety. In total, the

<b>Environmental standards in production</b>	above and beyond legal restrictions	38,88
	strict adherence to legal environmental standards	27,13
	no information	-66,02
<b>Animal Husbandry</b>	reduced number of animals per stall, with straw bed	29,11
	reduced number of animals per stall	13,52
	strictly according to legal restrictions	11,08
	no information	-53,71
<b>Animal feeding</b>	no addition of genetically-modified feedstuffs	17,85
	farm-internal and regional feedstuffs are used	28,48
	use of feedstuffs strictly according to legal restrictions	10,08
	no information on feedstuffs used	-56,41
<b>Animal slaughter</b>	in the local region	43,94
	in Germany	24,19
	in Europe	-24,44
	no information	-43,70
<b>Animal origin</b>	from the local region	44,32
	from Germany	28,74
	from Europe	-22,09
	no information	-50,97
<b>Producer Information</b>	names of all involved firms	34,12
	name of farmer and slaughterhouse	25,86
	name of one involved producer only	-11,55
	no producer name given	-48,43
<b>Food safety</b>	QS-Ihr Prüfsystem für Lebensmittel!	27,66
	from controlled production	33,47
	no information	-61,13
<b>Brand</b>	Hofglück Markenfleisch	9,61
	Kornmeyer Fleischwaren	-1,13
	gut&preiswert	4,30
	no brand	-12,78
<b>Price</b>	13,66 €/Kg	-46,96
	9,50 €/Kg	-14,13

Fig.7: Averaged standardised part-worth utilities.

respondents desire more information about the production process, i.e. there is a general demand for more transparency. These results are confirmed in detail through the conjoint results for the individual levels of the transparency attributes. It seems that the responses of the probands validate the attempts by NGOs to increase transparency.

But if one observes in detail the levels and their meaning, one finds that information with less informative content regarding the production process, like "from controlled production" sometimes provide more utility for the probands than product information with detailed data on the production process, like "QS-Ihr Prüfsystem für Lebensmittel!".

This means that it is questionable whether every consumer can differentiate between the quality of the various types of information, or whether for some consumers the mere presence of information, or a certain quantity of it, provide utility. It is thinkable that some consumers find utility in information on, for instance, adherence to legal standards. Other consumers who know more about the production process perceive adherence to the law in production as obligatory. For these, this sort of information on a product does not provide utility, and is not a signal of transparency.

In this context, and considering the calculated standard deviations, it can be concluded that additional research is needed with regard to this study. This research should take into account the obvious heterogeneity of respondents in the sample in further studies. One promising approach would be a segmentation using a cluster analysis, for instance using the determined knowledge level concerning meat products, or sociodemographic data like education level or income.

In order to derive results, especially for the product politics of meat-producing firms, a market simulation should be carried out that uses the collected data. This would allow a simulation of demand functions for products with varying levels of transparency attributes. For producer- and trade firms, this methodology could show whether transparency initiatives in meat production actually result in a higher market share or a higher readiness to pay for consumers.

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