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**Paper prepared for presentation at the 1st International European Forum on
Innovation and System Dynamics in Food Networks
Officially endorsed by the European Association of Agricultural Economists
(EAAE), Innsbruck-Igls, Austria
February 15-17, 2007**

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1. Introduction

Meat is one of the most important products concerning sales in the food retail sector in industrialised countries. Confirming Eurostat (2007), almost 45% of the agricultural output in the EU 15 comes from meat. However, production figures of some meat products, especially beef, declined dramatically during the last ten years (minus 690 000 tons between 1995 and 2005 within the EU 15).¹

Due to several major food scandals in the meat sector (BSE, bird flu, etc.) consumers are actually quite suspicious towards meat quality and production conditions. Some try to change their eating behaviour (less meat), others change from one product category to another (from beef to chicken). As a result, the demand for specific meat products declined during the last decade and the one with the most dramatic decrease was definitely beef (as a consequence of the BSE-crisis). Therefore, producers and supermarket chains tend to use quality labels to suggest reliability of their meat products. The following study investigates the importance and relevance of several quality labels. For this purpose we used a routine method of the measurement of consumer perceptions, the Conjoint Analysis.

2. Problem definition and research question

In General, we understand under “quality labels” each label which gives consumers clues about the quality standard and related information of a special food product. There are also other labels available, e.g. labels of origin (which are becoming more and more important because of the requirements of food traceability; see Haas et al., 2003) and producers vs. private labels (referring to the producer of a food product; Bruhn, 1994, 9). Each label assures consumers to buy products of a predefined quality standard and/or origin of production as well as explicit mechanisms of control (Sattler, 1991, 9). Furthermore, all conditions under which a product may be labelled must be public (Scherer, 1988, 24). The use of labels is connected with several important advantages: simplicity of usage, reduction of information, transparency (e.g. origin, production method, etc.), and traceability (in the case of a label of origin).

These are the main reasons why producers and traders tend to use quality labels for food products inflationary. Actually, many food products bear a lot of seals and labels referring to specific quality standards, origin, production method, trade organization, etc. This may imply an

1. Related agricultural key figures are (EU 15):

Animal output 2005 (million Euro): 115 185.6 (crop output: 146 432.8)

Production of cattle 2005 (1000 tons): 7 279.1

Production of cattle 1995 (1000 tons): 7 965.8

information overload where consumers are not able to distinguish between the labels and to connect a single label with specific contents and/or regulations. Consequently, the main aim of a label as an explicit signal of quality vanishes. The consumer is not able to distinguish between the aims and goals of the labels on the product.

This study tries to evaluate selected quality labels (compared to related attributes) for beef to answer the following research question: How important are quality labels for consumers judging as quality clues and what are the relevant factors influencing consumers in their buying decision? Furthermore, we analyzed if consumers are able to name specific brands¹ for beef products in Austria: Are consumers thinking of branded products in the beef sector?

3. Quality labels in the Austrian beef sector

In general, Austrian beef is a product which can be rather classified as “unbranded”. Actually, there are no strong beef brands available which are well known by Austrian consumers (with some exceptions; see below). Nevertheless, beef products are usually labelled with several emblems. Some of the possible emblems are:

- The so-called “AMA Gütesiegel” (“Austrian Quality Label”) distributed by the Austrian Marketing Association (AMA); this label is awarded for all Austrian food products maintaining pre-defined standards; the Austrian Quality Label is probably the one with the highest recognition value in the Austrian food sector.
- Emblems of several organizations referring to organic production.
- A very well known private label under which solely organic food is distributed; this is an umbrella brand subsuming many product lines.
- Some producers’ labels (with rather mean publicity): “Styria Beef” (Styrian beef producers), “Premium rind” (quality label of Lower Austrian beef producers), etc.
- Labels of origin (e.g. the so-called “Bauernhofgarantie”; guarantee of origin used by the biggest Austrian food retailer)
-

However, there is no empirical evidence available if the labels influence buying decisions of consumers. Most of the labels try to suggest specific quality standards but the question remains unanswered if consumers perceive and understand the particular message.

4. Methodology

To measure the importance and relevance of quality labels it is useful to use methods of consumer preferences analysis. There are several methods available to evaluate consumer preferences. The simplest form is to measure preferences for single product attributes by the use of rating scales. A methodological weakness of this approach is that consumers in real-life buying situations are faced with a bundle of product attributes but not with isolated product features. A method which takes into account that consumers evaluate whole products and normally not single attributes is the conjoint analysis (CA). Since the invention of the CA by Green in the 1970ies (Green and Wind, 1975) several methodological improvements are available (see table 1). “Conjoint analysis has been used in identifying new product opportunities, choosing appro-

1. Brands are usually seen to be important quality clues in the food sector guaranteeing consumers specific – usually intrinsic – quality features.

appropriate pricing strategies, product characteristics, identifying market segments, and deciding optimal advertising strategies” (Mishra and Umesh, 2005, 301).¹

More generally spoken, the application of the CA is useful within the new development process to evaluate product prototypes and/or product concepts and to establish the ideal product. The CA estimates utility functions for each attribute and each attribute characteristic implemented within the CA. Because of this realistic way of estimating utilities “Conjoint analysis (CA) is the most popular approach for measuring customer preferences in marketing research” (Scholl et al. 2005, 766).

Table 1. Methods for the evaluation of attribute characteristics

Multi-attributive utility measurement	Traditional CA	Hybrid variants of CA	Other variants of CA
Rating methods Analytic Hierarchy Process	Two Factor Method Full Profile Method	Hybrid CA Adaptive CA Individualized CA Customized CA	Limit CA Choice Based CA Bridging CA Hierarchical CA Repeated Stack Sorting

Source: Albrecht, 2000, 22

For this study we decided to use a more uncommon method of preference measurement, the Limit Conjoint Analysis (LCA). The main advantage of the LCA is the consideration of consumers’ purchase intentions. In addition to the normal ranking procedure of products (or product concepts) consumers are asked within the LCA to limit their ranking to those CA-cards (representing the product concepts) which they probably would buy (Voeth, 2000).

Concerning the algorithm for estimating utility values, Mishra and Umesh (2005, 308) could proof that the validity of LINMAP and MONANOVA are more preferable compared to the OLS-algorithm (the latter is the most common algorithm used in CA). In addition, the differences in terms of validity are dependable of how rankings were collected (Park, 2003, 1095). In order to examine validity of the LCA we used so-called “holdout cards”. This is a common method within CA to check if the results are reliable.

5. Product attributes

The routine CA-approach to estimate utility functions is to collect ranking judgements by consumers. This can be done by offering real products (product prototypes) or product concepts (e.g. verbal description of products, product images). In this respect, the challenge is to select a sufficient number of product attributes and attribute characteristics to be able to evaluate utilities realistically. However, the inclusion of numerous attributes and attribute characteristics leads to a huge number of product concepts and consumers’ information overload as a consequence. “Pragmatic concerns the number of attributes and the levels comprising each attribute, the number of attributes included in a stimulus, and the number of stimuli presented to the respondents for evaluation” (Huang and Fu, 1995, 40). On the basis of several studies dealing with the importance of product attributes for food in general (AMA, 2005), and meat (AMA, 2003)

1. A general overview and discussion about the method can be found in Green et al., 2001.

and beef (AMA, s.a.) in particular, we selected the following extrinsic quality clues relevant for this study:

Table 2. Product attributes for LCA-plancards

Attribute	Special features	Operationalization	No. of attribute characteristics
Price	low price for promotions; bulk packs; mid-price level; premium price for organic meat	in Euro per kg	4
Freshness	–	minimum durability date	2
Traceability	–	special quality labels and labels of origin	2
Quality	–	operationalized via quality labels	2

Table 3. Reduced design for LCA-plancards

Plancard	Price	Quality label of beef producer (“Premium Rind”)	Austrian quality label	Minimum durability date	Guarantee of farm provenience (label of trade organization)	Utility calculation
A	normal	no	yes	short	No	yes
B	bulk pack	no	yes	long	Yes	yes
C	organic	yes	yes	long	No	yes
D	promotion price	no	no	long	No	yes
E	normal	yes	no	long	Yes	yes
F	big pack	yes	no	short	No	yes
G	promotion price	yes	yes	short	Yes	yes
H	organic	no	no	short	Yes	yes
I	organic	no	no	short	No	no (holdout)
J	bulk pack	no	no	long	Yes	no (holdout)

Out of these attributes a full profile of all possible product concepts would contain 32 LCA-plancards. Of course, this number overburdens consumers within the evaluation process. Therefore, LCA (and CA as well) usually calculates a reduced design. In our case, only 10 plancards were necessary to be able to calculate utilities for all attributes and attribute characteristics (plancard A to J; see table 3).







Plancard	Price	Quality label of beef producer ("Premium Rind")	Austrian quality label	Minimum durability date	Guarantee of farm provenience (label of trade organization)
Visualization	normal price: no label 12,99 €/ kg			bei +2° bis +4°C zu verbrauchen bis: 26.04.2006	
	Preisvorteil bei Großpackung <small>Unser Fleisch ist frisch und nicht dabei beiwirksam angefertigt worden, ohne darauf zu einer Qualitätsstufe erhoben.</small> bulk pack 11,99 €/ kg			short durability	
	 organic 13,99 / kg	 combination of quality labels	bei +2° bis +4°C zu verbrauchen bis: 30.04.2006		
 promotion 8,99 €/ kg	long durability				

Figure 1. Visualization of LCA-plancards

We visualized the plancards via photographs of a pre-packed meat peace (no variation; 0,886 kg) and the symbols in fig. 1. The plancards represented existing products which could be found in the meat shelf in a comparable manner (scale 1:1). One main advantage of this approach is the comparability of all plancards (the appearance of the meat stick is constant and has therefore no influence on the results). Of course, to some extent this is associated with artificiality compared to an experiment with real products.



Figure 2. Product image for CA: Card C, the most preferred one¹

6. Survey and results

Based on a consumer field experiment with 400 participants using the LCA, we found out that not all labels are recognized by consumers as quality clues to the same extent. The quality label with the highest utility value is the pre-mentioned “Austrian Quality Label / AMA Gütesiegel”. The Austrian Marketing Association (AMA) appoints this quality label to food producers if a number of rather stringent requirements were fulfilled. The label possesses a high grade of publicity as the AMA made a lot of advertising for it during the last decade. However, other quality labels – we used two other quality labels: a label of an Austrian beef producer (“Premium Rind”) and a label of an Austrian trade organization referring to origin (“Bauernhofgarantie” / “Guarantee of Farm Provenience”) – achieved much lower utility values (see fig. 1).

Other attributes (e.g. organic production, price level) seem to be of at least the same importance compared to quality labels and consumers tend to assess these attributes as quality indicators. This can be said because the price level, the most important attribute confirming our analysis, is a so-called reverse utility attribute: In our survey higher price levels are mostly connected with higher utility values. Usually, one would expect a contrary correlation (higher prices are less preferable).

1. The approximate size of the image in fig. 1 is about 50% of the presented placard.

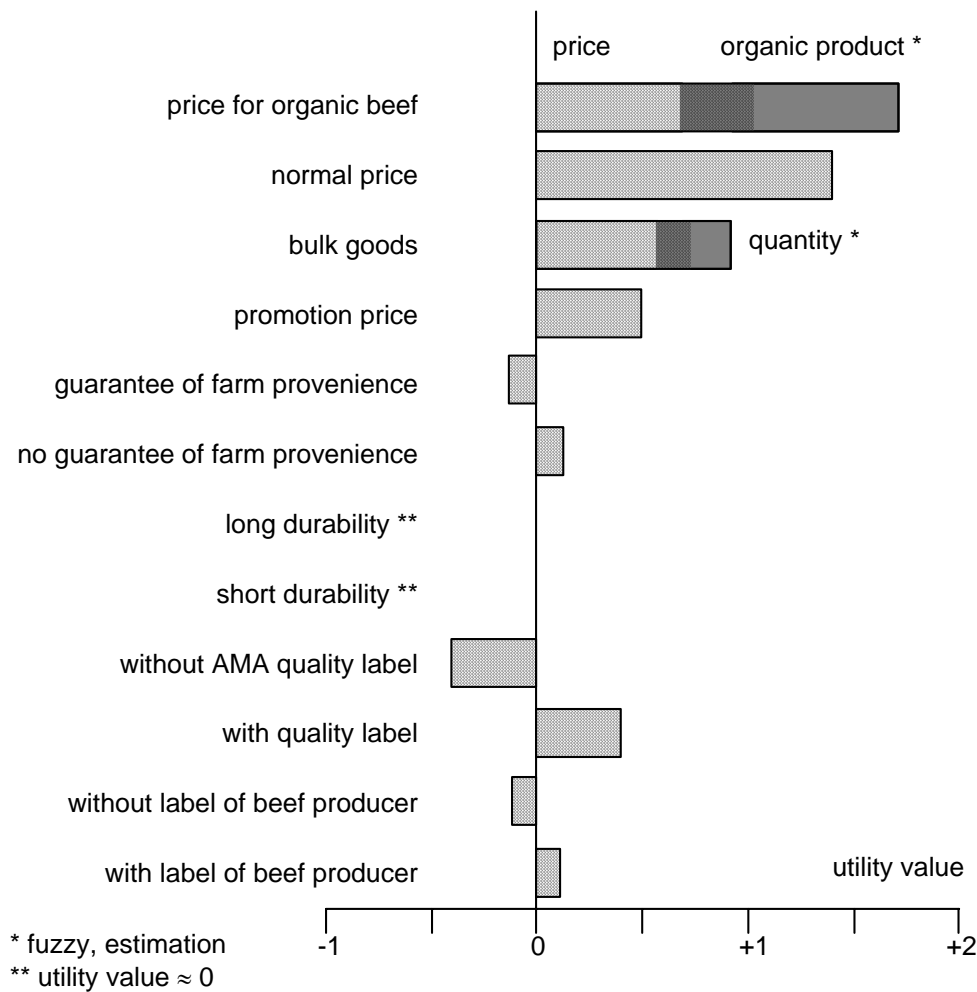


Figure 3. Utility values of product attributes

The attribute with the highest utility value is the high price level for organic food. We suppose that consumers ranked the relevant CA-cards top also because of the characteristic “organic” and not only because of the price level. Therefore, this attribute should be split into two different product characteristics: high price level and organic production of beef. In figure 1 the utility value is split whereby the metric amount of each attribute can only be estimated and not calculated (“fuzzy utility value”). At least this shows a methodological problem connected with the CA: If an attribute is connected with another or others – in our case: organic food is usually only available at a high price level – it is not possible to conclude on the importance of each single characteristic. However, in order to get realistic evaluations, it is not advisable to ignore important product attributes. In this respect we had to make a trade-off between closeness to reality and scientific demands – an inherent problem of scientific research. Similar conclusions could be drawn for the product attribute “price level for bulk packs”. Here too, we have two product characteristics which are connected and dependent. Consequently, quality labels are not as important for the buying decision of consumers as food producers and trade organizations might suppose.

Another astonishing result is the fact that consumers presumably don't bear in mind "freshness" as a core indicator within their evaluation: Freshness is indicated as one of the most important factors in all relevant studies we found.¹ Confirming our analysis freshness and the respective attribute "minimum durability date" which has to be printed on all pre-packed food products in Austria comes near to a utility value of 0. Therefore, it makes not a big difference for consumers if the durability of the pre-packed beef is long or short. Probably, the typically small fonts of the applied imprints are not read by average consumers; however, this is only an assumption, we cannot make reliable conclusions on that.

Considering the *overall importance* of product attributes calculated by the LCA, the most important attribute is certainly the price level. However, the operationalization of the product attribute "price" was connected with other characteristics (like organic production or quantity; see fig. 2). None of the labels we used in our study were completely dispensable, the importance of the relevant attributes lies between 12 and 16%.

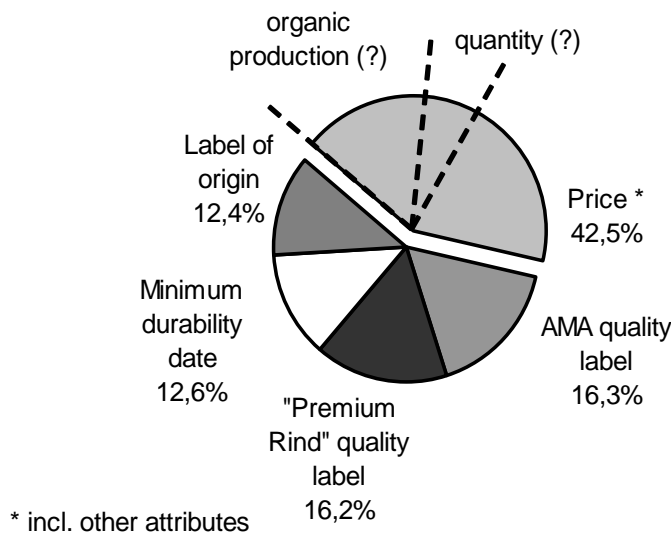


Figure 4. Overall importance of product attributes

However, brands and producer labels are not very well known in the meat sector. We demanded the interviewed consumers to name brands for beef and with one exception (the private label for organic food of the biggest Austrian food retailer) beef brands are not very well known by Austrian consumers. The referring question was posed open-ended to test consumers' recollection of meat brands. If we would have posed the question on a multiple-choice basis the recognition of brands would have been definitely higher.

1. Within this study we asked the interviewees to evaluate product characteristics directly (in addition to the CA-ranking). The results differ completely from the results of the CA: In contradiction to the results of the CA, freshness is the most important product characteristic. In real life consumers will possibly estimate "freshness" on the basis of visual impressions (color of the beef) rather than on the basis of minimum durability dates.

The validity of the results is high¹; in connection with the unusual large sample size (unusual for a CA where typically 100 to 150 people are interviewed) it is verisimilar that the results represent the true “setting” of Austrian consumers concerning quality brands and labels in the beef sector.²

7. Conclusion and discussion

The main key success factor for the perception of a quality label is persistence in terms of marketing. This can be clearly shown by the perception of the AMA quality label compared to the others tested in the experiment. However, the abundant application of quality labels on the same product leads to irritation and confusion of consumers – and does not increase trust towards the product. A clear indicator for that are the moderate utility values for the other labels. Therefore, other quality clues (e.g. high price level to signalize high quality food) have a significant impact on consumers’ quality perception. Likewise, a clear and persistent marketing strategy is indispensable to achieve the considered objectives of a quality label.

The usage of the LCA showed some explicit problems in connection with the selection of the product attributes. The results related with the price level were surprising: Most of the consumers preferred a high price level (linked with organic production) classified by the LCA as “reversals”. We suppose that the price level is one of the most valid quality clues. In addition, another important quality clue influencing consumers’ buying decision seems to be organic production (see fig. 1, upper bar). However, the evaluation had no real consequences: consumers only evaluated product concepts, i.e. an artificial buying situation. This artificiality is a core challenge of a CA: Obviously in real life some (or even many) consumers might choose differently and prefer less costly products.

Therefore, if a producer wants to signalize high quality it is advisable to use a combination of different quality clues: prudential application of quality labels, premium price level and clear traceability (worthless to mention that other aspects like freshness and good taste are unconditional requirements for fresh food; Grunert et al., 2000). And – most important – a producer needs proverbially spoken “deep pockets” to maintain a quality campaign in the long run, too.

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1. As mentioned above we measured it via “holdout cards” which were ranked by consumers during the survey but which are not taken for utility calculation of attributes and attribute characteristics. If the afterwards calculated utilities for the holdout cards come close to the true ranking of consumers it may be concluded that the results of the CA are statistically valid.
 2. Strictly spoken, the study was made in Eastern Austria. There might be slight differences compared to Western Austria. However, we are confident that these differences may be neglected without corrupting the conclusions dramatically.

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