



The effect of information on beef husbandry systems on consumers' preferences and willingness to pay

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ABSTRACT

This paper evaluates communication treatments and price differentiation for beef raised organically and in conventional animal husbandry production systems. Data were obtained from a choice experiment, assessing animal husbandry, organic or conventional production and price, with 676 consumers in six grocery stores in three different German cities. When choosing beef, participants exhibited a high preference for enhanced husbandry conditions and organic production. Without further information about the husbandry conditions, 'organic' and 'pasture-based' production labelling was most likely to influence buying decisions. When informed about the conditions of 'extensive suckler cow husbandry', consumers were most likely to be motivated by the label 'extensive suckler cow husbandry', followed by 'organic production'; accordingly, willingness to pay for a beef steak was highest for 'extensive suckler cow husbandry'. Informing consumers about suckler cow husbandry results in a change of their preferences from 'organic' to 'extensive suckler cow husbandry'. This holds great potential for extensively produced beef.

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1. Introduction

An increasing number of consumers show strong interest in, and actively choose, foods which are ethically produced and animal welfare has become an important aspect of ethical food choice decisions (Fernqvist & Ekelund, 2014; Lagerkvist, Carlsson, & Viske, 2006; Napolitano, Caporale, Carlucci, & Monteleone, 2007; Sans & Sanjuán-López, 2015). Animal welfare, however, is a complex issue (Vanhonacker & Verbeke, 2014). Stakeholders along the value chain of meat often have very different definitions of animal welfare (Fisher, 2009). Apart from the difficulties in defining animal welfare, responsibilities for improving animal welfare are delegated all along the value chain (Sundrum, 2007), without any clear action towards taking responsibility. Nowadays, an improvement in animal welfare will most likely be market driven rather than through an enhancement in administrative animal welfare standards (Vanhonacker & Verbeke, 2014).

At present, it is hard for consumers to distinguish products from enhanced animal welfare, as it is often part of a broader quality assurance scheme (Vanhonacker & Verbeke, 2014). Nonetheless, European consumers would like to know how animals are treated and under what conditions animals are raised (Eurobarometer, 2006, 2016). Consumers believe that animal husbandry systems are bettered by improving rearing conditions regarding housing, parental care, social interaction, and access to outdoor areas (Borkfelt, Kondrup, Röcklinsberg, Bjørkdahl, &

Gjerris, 2015). Extensive suckler cow husbandry is a form of animal husbandry which should meet consumer preferences for improved animal welfare, as calves are raised in a natural environment and stay with their mothers in a herd for several months. Extensive suckler cow husbandry fulfills additional requirements for a sustainable production scheme. Since cattle can be held on pastureland or even in low-nutrient habitats, ecologically important areas can be preserved. This is also of high consumer and societal concern (Eurobarometer, 2010, 2015).

The husbandry system is considered a credence quality attribute which cannot be immediately 'experienced' by the consumer as opposed to an experience quality attribute like taste (Napolitano et al., 2007). Therefore, credence quality attributes need to be communicated to the target group in a clear and trustworthy manner. Communication of additional extrinsic food qualities, such as enhanced husbandry systems, usually takes place via labelling and short messages on food packaging. Consumers usually value additional information on husbandry conditions (Vanhonacker & Verbeke, 2009; Viegas, Nunes, Madureira, Fontes, & Santos, 2014; Weinrich, Franz, & Spiller, 2014). However, the overall use of corresponding labels is limited (Grunert, Hieke, & Wills, 2014; Vanhonacker & Verbeke, 2014). Food choices are often made routinely rather than after a full information search (Ingenbleek & Immink, 2011). Given the complexity of animal husbandry labelling and limited use of corresponding labels, extensive informational material was developed to accompany the evaluation of labelling according to beef husbandry systems.

The objectives of this paper are to assess the potential of animal husbandry labelling for beef and to explore the effect of such labelling on

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consumers' preferences and willingness to pay (WTP). Discrete choice experiments were conducted along with face-to-face interviews to examine the potential of such beef labelling. The combination of extensive, comprehensive communication measures in conjunction with a food choice experiment is a novel approach and has, to the authors' knowledge, never been applied to the exploration of consumers' acceptance and WTP for beef labelling according to husbandry systems.

2. Material and methods

Cross-sectional consumer data was collected using a quantitative survey approach in which consumer choice experiments were conducted to measure the importance of quality attributes for alternatively produced beef and the impact of different communication materials.

2.1. Description of tested husbandry systems and corresponding labelling

In the end, consumers' perspective and their expectations decide the success of beef products (Grunert, Bredahl, & Brunsø, 2004) offered under different husbandry systems and corresponding labelling. Extensive suckler cow husbandry should meet consumer preferences for animal welfare. Hence, 'extensive suckler cow husbandry' labelling served as a premium starting point to distinguish different husbandry systems for cattle. Since there are many different extensive, pasture based grazing systems worldwide, we met with local practitioners and experts along the value chain for beef for a one-day workshop to consider realistic husbandry systems in Germany and to establish the following definition of 'extensive suckler cow husbandry' used for the present study: 'Unlike other pasture-based or barn-based production systems, calves can stay with the mother cows for several months; calves must be suckled for at least six months; cattle are kept outdoors during growing season; cattle can behave according to natural behavior patterns; cattle are kept in herds; feeding is based on pasture grass and stored forage; as fodder additive, a limited amount of whole grain is offered; calves are slaughtered from the age of 12 to 36 months'. As most produced beef originates from dairy farming in Germany (Deblitz, Brömmer, & Brüggemann, 2008), where extensive suckler cow-based husbandry is not practiced but animals could be held on pasture, 'pasture-based' was included as an intermediate between 'barn-based' and 'extensive suckler cow-based' husbandry. It included outdoor access for the cattle and feeding based on pasture. In comparison to extensive suckler cow husbandry, societal aspects of the cow-calf-relationship were not taken into account. 'Barn-based', where cattle are kept indoors, served as a conventional alternative. Feeding is mainly based on concentrate.

2.2. Description of communication treatment

Product differentiation with regard to beef cattle husbandry systems was reviewed for the German beef market. Results revealed that beef products from suckler cow based husbandry are mainly marketed via quality brands or via direct marketing. Besides taste, extrinsic quality aspects of animal welfare play a predominant role, followed by naturalness, extensive farming practices and local production. These aspects of extensive suckler cow husbandry were incorporated into a communication concept in this order, to explain the details of this production system to consumers. As opposed to short messages or labels (Grunert et al., 2014; Meise, Rudolph, Kenning, & Phillips, 2014; Napolitano et al., 2007; Viegas et al., 2014), extensive, comprehensible communication measures were taken in the presented study to accommodate the complexity of animal husbandry labelling. Three different communication formats were compiled together with a scientific working group for film and television: a documentary film (4 min), an image film (4 min), and an informational leaflet (Size: DIN/ISO A4, 6 Pages).

2.3. Description of the choice experiment and data collection

Following the communication treatment, consumers were presented a simulated buying decision, implemented by a choice experiment. Choice experiments are increasingly used to simulate consumer behavior by measuring consumer preferences and choices (Hensher, Rose, & Greene, 2015; Lagerkvist et al., 2006). A discrete choice experiment on the basis of a pivot design was created in which three different 200 g beef steaks with different product attributes were offered. The beef steaks varied in regard to the husbandry system, organic or conventional production, and price (ref. to Table 1). Within the choice experiment, the husbandry system had three different levels: barn-based production, pasture-based production, and extensive suckler cow-based production. Furthermore, the production could either be organic (according to EU-legislation) or conventional. Three different price levels were applied systematically: €3.98, €5.98, and €7.98. Conventional, barn-based production was restricted to the lowest price level of €1.98 to simulate realistic market conditions.

The price levels were chosen according to a pre-market survey taken in German food shops in March 2013 previous to the consumer survey. In addition, consumers could decide not to buy any of the steaks (Fig. 1).

All participants were confronted with nine choice-sets offering three beef steaks and the No-Buy-Option with varying extrinsic parameters. Validity of the choice task was enhanced by communicating one randomly elected choice-set as binding (Lusk & Schroeder, 2004). Overall, 6084 choice sets were the basis for data analysis. An accompanying questionnaire was given to identify consumer characteristics. Data was gathered using computer-assisted self-interviewing (CASI) to avoid social desirability bias as it was the basis for WTP measures. The survey was pretested in two different cities with 20 individuals.

Data collection took place in front of the six shops in Germany and was carried out by a professional market research institute with interviewers trained and guided by the first author of this article.

Data was collected in two different types of shops - a conventional supermarket and an organic food store - in three German cities during April and May 2013. Equal shares of consumers were recruited in each site and screened for their consumption of beef. Data collection took place 'in-store' to reach consumers who are responsible for food purchases of their household. In all, 676 beef consumers were interviewed. The sample was randomly divided into four groups in order to assess the different communication materials: 171 consumers were shown the documentary film, 168 consumers were shown the image film, 169 consumers received the informational leaflet, and 168 consumers served as a control group and received no further information.

2.4. Description of data analysis

Random parameter logit modelling (RPL) was used to elicit consumer preferences for the extrinsic parameters under examination and the effect of different communication treatments. The analysis is based on a random utility framework. The models estimated on the choice data reveal the surveyed individuals' preferences for the discrete set of steak alternatives offered. As such, the observed outcomes only reveal relative preferences for the set of steak alternatives that were modelled.

Table 1
Attributes and levels of the choice experiment.

Attribute	Definition	Level
Animal husbandry	Animal husbandry with regard to environmental and societal aspects	Barn-based, pasture-based, extensive suckler cow-based
Production	Agricultural production system	Organic, conventional
Price	Price for a 200 g beef steak	€1.98 ^a , €3.98; €5.98; €7.98

^a Conventional, barn-based production was restricted to the lowest price level of €1.98 to simulate realistic market conditions.

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