

# The Role of Quality Labels in Market-Driven Animal Welfare

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**Abstract** In policy-making the consumption of specially labelled products, and its role in improving the welfare of livestock, has attracted considerable attention. There is in many countries a diverse market for animal welfare-friendly products which is potentially confusing and may lack transparency. We ask whether special quality labels that involve medium levels of animal welfare, as compared with labels promoting premium levels of animal welfare, have a role to play in promoting improvements in animal welfare. The Danish pork market is our reference case, but we also widen the context by comparing the markets for pork in three other European countries. Our findings suggest that in order to improve animal welfare through demand for welfare-friendly products it is important to maintain separate the market for products with strong animal welfare profiles from markets for products with medium levels of animal welfare where, often, animal welfare is bundled together with other food quality attributes. We conclude that such quality labels may indeed play an important role in promoting higher animal welfare standards provided that they offer real improvements in animal welfare as compared with standard products. They will be attractive to consumers with a positive, but not especially strong interest in animal welfare as an individual food attribute who would otherwise be inclined to purchase standard products.

**Keywords** Animal welfare · Pigs · Consumer behaviour · Food policy · Food labelling

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## Introduction

Particularly in northern Europe farm animal welfare has been on the political agenda for decades, and legislation has been implemented to protect animal welfare at national as well as international levels (Fraser 2008a). However, concerns about the competitiveness of farmers operating under stricter local animal welfare legislations than their competitors and the complexities in obtaining international agreements on animal welfare legislation have turned interest towards market-based improvements in animal welfare (Christensen et al. 2012). Thus labels indicating animal welfare are of interest to policy-makers, who see the stimulation of this special kind of food consumption as a vehicle for improving welfare (e.g. Grethe 2007; Ingenbleek et al. 2013; McInerney 2004; Veissier et al. 2008). However, consumer studies have suggested that consumers tend to be confused about the large variety of animal welfare claims being made in food marketing (Evans and Miele 2008; Schröder and McEachern 2004). In fact, competing, and confusing, labelling schemes were identified as a major obstacle to market-driven improvements in animal welfare in a consumer survey reported by the European Commission (2005). Thus, as part of an EU action plan for animal welfare, the Commission recommended uniform standards and labels that clearly signal welfare features to consumers, viewing this as a tool with which markets for animal welfare-friendly products could be expanded and improved European Commission (2006).

At the same time, a growing body of research indicates that consumer interest in animal welfare is very heterogeneous. Specifically, existing studies point to the existence of three distinct consumer segments: the first is very interested in animal welfare issues; the second is rather indifferent; while the third is somewhere in between and captures consumers who are interested in animal welfare to some extent but also focus on other attributes connected with gustatory quality and healthiness. This pattern has been identified around Europe in consumer attitudes to farm animal welfare in general (Vanhonacker et al. 2007; Vanhonacker and Verbeke 2014), to beef (Grunert and Valli 2001), and to pork (Meuwissen and Van Der Lans 2005; Mørkbak et al. 2010). In particular, Vanhonacker and Verbeke (2014) find that some consumers are dedicated to various products promising high animal welfare standards, and that to this group price is secondary, while consumers in other segments who are also inclined to purchase these products are sensitive to high price premiums.

So, despite the confusion that the great variety of animal welfare claims might cause, these consumer studies indicate that there is a market for not only bulk standard products and premium standards<sup>1</sup> as free-range and organic animal products but also for products with medium levels of animal welfare characterized by welfare standards that are set above the legal minimum but below the premium.

Our hypothesis is that consumers' preferences for animal welfare are so heterogeneous that a single premium welfare label cannot be used to target all

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<sup>1</sup> At this point it is important to note that the term 'premium welfare' in the present paper is used because these are the highest standards being marketed; it does not imply that the animal welfare in question cannot be improved further.

consumers with an interest in animal welfare. We therefore ask how, and to what extent, the consumption of animal products with improved but not premium welfare—what we shall call ‘medium’ welfare—can contribute to overall improvements in farm animal welfare.

We use the term ‘quality label’ to refer to labelling where (1) animal welfare is just one element among other quality characteristics and thus is a more extensive quality concept, and (2) animal welfare improvements are claimed at the medium level.

A quality label might include a broad sustainability claim involving animal welfare at medium level and the satisfaction of standards for energy use and environmental impact. Examples of similar labelling include the Dutch labels Milieukeur or the Keten Duurzaam Varkensvlees label for pork. Other examples of quality labels that incorporate taste and improved animal welfare include the Danish brand Bornholmergrisen and labels used by the major British supermarket chain Sainsbury’s (Christensen et al. forthcoming).

The role of quality labels in promoting animal welfare has received little attention in the policy context, but based on the consumer studies mentioned above we believe there is a need for further research into the use of quality labels as a means to improve market-driven animal welfare.

We draw on a case study of the Danish market for welfare-friendly pork. Over the last 20 years the Danish pork market has seen a rapid proliferation of labelling schemes guaranteeing that pigs are raised or processed differently from the way they are in standard production. According to Jensen (2008) at least 22 labels have been introduced (and in many cases suspended) over the last three decades. An overview of these labels is given in Table 1.

The quality claims associated with the labels in Table 1 include some referring to production practices that are unrelated to animal welfare. For instance, the suspended label ‘Hjalmar’ did not make a claim to improved animal welfare standards but was based on elements such as slaughter weight, and certain requirements relating to fat and meat content (Michelsen 1992). Yet, in recent years improved animal welfare has become an increasingly visible feature, and the existing labels on the Danish market listed in Table 2 integrate improved animal welfare in their production concepts. Given this growing emphasis on welfare we argue that the Danish market for pork provides a good vantage point from which to assess whether quality labels play a role in promoting animal welfare.

The paper is organized as follows. First, we present the methodology used to gather information about the Danish market for pork. Second, we provide an overview of animal welfare standards in Danish labelled pork products and analyse the extent to which products are sold under the various labels. Third, we turn to the significance of animal welfare in the Danish market for pork and analyse consumer attitudes and behaviour. Fourth, we discuss the role of quality labels indicating medium levels of animal welfare in market-driven improvements to animal welfare with a view to experiences from other European countries. Finally, we conclude on the possible role for quality labels in improving the welfare of pigs.

**Table 1** Overview of pork labelling schemes in Denmark

Existing labelling schemes	Økologisk gris, Frilandsgris, Antonius, Bornholmergrisen, Den Go'e Gris, Grambogårdgrisen,
Suspended labelling schemes	Enggrisen, Vitalius, Vores egen gris, Den 5 stjernede gris, Danske Slagtemestres gris, Dreisler-grisen, Flexgrisen, Formel A-grisen, Gourmet-grisen, Guldgrisen, Hjalmar, Martelli, Mester Porker, Præmiegrisen, Skovgrisen, Steff Italiensgrise, Den blå lup

Source Jensen (2008)

## Methodology

To investigate quality labels that include medium levels of animal welfare we conducted an integrative research, i.e. a review which 'synthesizes representative literature on a topic in an integrated way such that new frameworks and perspectives on the topic are generated' (Torraco 2005:356). We chose this approach as the proposed investigation required us to combine several types of data and material.

First, it was necessary to draw on different types of market data in order to understand the demand for animal welfare as a food attribute in the Danish market for pork. Here, we found it useful to scrutinize studies of consumer attitudes to pork labelling schemes, consumer's purchasing motives, and their willingness to pay (WTP). However, as all of these types of study are based on stated behaviour we also found it useful to include data that relate to actual market behaviour in the form of market shares. Investigation of the benefits of combining revealed and stated preference data can be found in Adamowicz et al. (1994), Ben-Akiva et al. (1994) and Birol et al. (2006).

Second, we believed it was essential to involve sources related to pig production which enabled a comparison of animal welfare within different types of labelling scheme. Here we particularly drew on production manuals, marketing materials and studies of consumer attitudes to pig welfare. Excellent studies of the market for animal welfare-friendly food have been conducted in, for instance, Switzerland (Phan-Huy and Fawaz 2003) and the United Kingdom (Roe and Murdoch 2006). These studies are mainly based on reviews of consumption data, however, while the present study seeks to integrate data on consumption as well as the animal welfare claims that are guaranteed by the various labels. This gives us the opportunity to combine discussions of animal welfare standards under quality labels with discussions of the market position of quality labels. In this respect we believe the present study makes an original contribution to the existing body of research on market-based ways of improving animal welfare.

We have also drawn on primary survey data to clarify Danish consumers' motives for purchasing pork. These data were collected as part of a choice experiment in Mørkbak et al. (2010). In this study an online survey of consumers' stated preferences for various pork products, including stated preferences for pork derived from 'alternative production', was conducted. Prior to the survey, focus group interviews were performed. The interviews suggested that five attributes were important in consumers' choices of (as it happens, minced) pork. A total of 1,633

**Table 2** Selected animal welfare requirements in different labelling schemes for Danish pork

	Standard	Medium	Premium
Labels	Various	Antonius Den go'e gris (The good pig) Bornholmergrisen (The Bornholm pig)	Free-range Organic
Space per finisher pig (up to 100 kg)	0.65 m <sup>2</sup>	0.85 m <sup>2</sup>	Organic: 2.3 m <sup>2</sup> (1.3 m <sup>2</sup> indoor, 1 m <sup>2</sup> outdoor) Free-range: 1.2 m <sup>2</sup> (0.7 m <sup>2</sup> indoor, 0.5 m <sup>2</sup> outdoor)
Outdoor access	No	No	Yes
Loose sows	No	No	Yes
Tail docking	Tail docking widely practiced, even though routine tail-docking is not allowed	No	No
Weaning of piglets <sup>a</sup>	21 days	28 days	Organic: 49 days Free-range: 30 days

Source Christensen et al. (2014a)

<sup>a</sup> Information on weaning from found in Danish Crown (2007), (2008), Friland (2006), Kongsted and Hermansen (2005)

responses were obtained (response rate 31 %). The choice experiment was presented in Mørkbak et al. (2010), but a number of background questions offering more detailed information on consumer preferences for the five attributes have not previously been published. These questions are used in the current investigation to shed light on the consumption of animal welfare and standard products.

### Animal Welfare in Different Labelling Schemes

In clarifying the relationship between the consumption of quality labelled pork and improvements in pig welfare, it is useful to consider first the welfare standards guaranteed in different labelling schemes. The Danish pork market has a tripartite structure consisting of standard, medium and premium levels of animal welfare, in line with the findings of the literature presented in the introduction (see Table 2).

Standard Danish pork is sourced from production systems meeting the minimum legal requirements on animal welfare set mainly by the EU but also by Danish law. More than 95 % of Danish pig farmers participate in DANISH, the quality assurance scheme of the Danish pig industry (Pig Research Centre 2012). The high level of subscription is probably the result of economic incentives. Farmers need to participate in DANISH to meet the documentation requirements enforced within the

very important German export market; and DANISH farmers are paid a full settlement price for pork and live pigs, whilst farmers who stand outside the quality assurance scheme are paid less (Pig Research Centre 2014).

DANISH guarantees primarily that farmers receive control visits from an independent certifying agency which ensures that legislative and industry requirements are met. Moreover, the assurance scheme imposes special requirements on the handling of pigs during transport and the equipping of transportation vehicles (The Danish Agriculture and Food Council 2012). Thus, DANISH resembles other food quality programmes initiated in recent years such as the GLOBAL-GAP (Kalfagianni 2010; Lewis et al. 2008).

The category of medium animal welfare labels is made up mainly of three products produced by the slaughterhouse Danish Crown and marketed by different nationwide retail chains. In other words, the three products can be considered as private label products. In terms of animal welfare the three Danish quality labels are very similar; they are based on production systems similar to those of the standard production, but with improved housing conditions. According to Danish Crown (2007), (2008) finishers are allowed 30 % more space per animal than that required by law, and there are requirements on floor type, including a ban on fully slatted floors. Tail docking which is widely practiced in the standard production (according to the Working group on the keeping of pigs 2010), is also banned.

Bornholm pig production is a local speciality providing meat of higher eating quality than standard pork. Besides making special demands on animal welfare, it requires the pigs, and to some extent the feed, to be produced on the island of Bornholm (Danish Crown 2008). The integration of animal welfare into more general concepts of meat quality is reflected in the slogans under which these quality products are marketed: for example, 'more taste and welfare', in the case of the Bornholm pig label (Danish Consumer Council 2011a).

It is noteworthy that all pork products with medium levels of animal welfare in Denmark are sold as quality labelled products. Interestingly, also, animal welfare levels claimed in quality labels are not certified specifically by a third-party certification body, but are instead guaranteed as part of the quality label by the label owner.

Organic production resembles production under quality labels in the sense that several quality attributes are bundled together with welfare assurances. Nonetheless, in terms of animal welfare improvements, it seems reasonable to group organic pork together with free-range products as premium animal welfare labels, because organic products are characterized by an emphasis on higher levels of animal welfare as a distinctive quality. This is illustrated by the 2010 campaign for organic pork, which was initiated under the rallying cry 'Vote for curly'. This catchphrase, which refers to the fact that organic pigs are normally not tail-docked, was followed by information on other welfare gains in organic pig production (Friland 2006). Only free-range and organic products meet the requirements to be marketed with a supplementary label informing the consumer that the production is approved by the Danish Animal Welfare Society.

Allowing pigs to roam outdoors is a distinguishing feature of free-range as well as organic production and is emphasized in the private production standards of

Friland (2006) and the organic standards determined in EU and Danish legislation (Kongsted and Hermansen 2005). In particular, the rules of free-range and organic production (Friland 2006; Kongsted and Hermansen 2005) require all pigs to have permanent access to the outdoors. Piglets must be born in farrowing huts by loose sows, whereas finishers may be kept in stalls provided that certain requirements regarding the floor type and bedding as well as outdoor access are satisfied. A further feature of both production systems is that tail-docking is not permitted, while the time of weaning is prolonged as compared with standard production. On the other hand, free-range and organic productions do differ, as the defining criteria are generally more wide-ranging in the latter. Thus in addition to requiring substantially more space per animal, organic pig production also requires, for example, organically produced feed with no use of GMOs or synthetic fertilizers.

Whether, and to what extent, the medium and premium animal welfare labels are able to bring about animal welfare improvements depends, among other things, on the way animal welfare is defined. A detailed discussion of this definitional issue is beyond the scope of this paper, but one way to assess animal welfare (e.g. as suggested in Lund 2006; Fraser 2008b) distinguishes between animal welfare measures referring to:

1. Affective states of the animal, either positive (pleasure) or negative (distress, pain).
2. Biological functioning, either in a normal and satisfactory manner or under the influence of injuries and disease.
3. Natural living and thereby the animal's ability to express species-specific behaviour.

In some cases, these criteria may diverge; in others they will coincide. The *de facto* abstention from tail-docking, which characterizes all of the labelling schemes presented above, could, for instance, count as improving pig welfare in two ways: first, by promoting the natural living of pigs by enabling them to communicate through tail postures and by maintaining their natural appearance (welfare measure 3); second, by saving the pigs from the immediate pain (welfare measure 1) caused by the procedure of partly removing their tails (Working group on the keeping of pigs 2010).

The measures taken to secure the welfare of pigs are clearly far more comprehensive under free-range and organic pork than they are under the three quality labels marketed in Denmark. This is reflected not only in more extensive requirements on housing conditions and stocking densities (welfare measures 1 and 2), but also in the guarantee of outdoor access (welfare measure 3).

Several studies (Boogaard et al. 2011; Bredahl and Poulsen 2002; Lassen et al. 2006; Ngapo et al. 2003; Nielsen and Kristensen 2008) have shown that popular conceptions of pig welfare in Denmark typically involve the assumption that the pigs are allowed to roam freely and express species-specific behaviours, to maintain their natural appearance (undocked tails), and to eat natural fodder. Along similar lines, two determining factors in this lay view of animal welfare are found to be the

access of pigs to outdoor areas and sufficient space indoors (Kondrup and Lassen 2014). These results suggest that many people may take the animal welfare standards of free-range and organic systems of production to be better than those of quality labels because the latter do not guarantee outdoor access. These perceptions of animal welfare are reflected in a guide to animal welfare pork issued by The Danish Consumer Council (2011a). In this guide animal welfare standards in free-range and organic production were assessed as ‘really good,’ whereas those of quality labels were seen as ‘better than standard but not much better’.

Judging by the assessment of medium and premium animal welfare labels and the importance of quality labels described above, it seems clear that when consumers purchase quality labels instead of standard products this makes a positive contribution to pig welfare. However, the fact that an even greater contribution would be made if consumers purchased pork from animal-welfare labelled products such as free-range and organic products also needs to be considered.

### **Preferences for Welfare-Friendly Pork in the Danish Market**

In order to examine the extent to which quality labels attract consumers who would otherwise have purchased standard pork, and not free-range or organic products, we analysed the Danish market for pork. We suggest that this question involves assessing the general interest of consumers in welfare-friendly pork, as that interest is reflected in market shares and WTP, consumer perceptions of pork products, and the level of price premiums (see Table 3).

First and foremost, it seems important to try to gauge the actual strength of consumer interest in welfare-friendly pork. To some extent, this interest could be reflected in the market shares of welfare-friendly pork—especially in the shares of free-range and organic pork, both of which are strongly marketed on animal welfare, but also in the shares of quality labels. In a recent estimate (personal communication: Karl Christian Møller, Danish Crown), free-range and organic pork were found to have a market share of about 9 %, while the quality labels occupied a value-share of 15 %, of the domestic sales of pork produced in Denmark. With import shares of around 20 % in 2013, the overall market shares are a little smaller (7 and 12 %, respectively). This suggests that total interest in welfare-friendly pork in Denmark is presently rather moderate—especially when compared with other and more successful markets for animal welfare-friendly animal products in Denmark such as milk and eggs (Heerwagen et al. 2013). Moreover, it is interesting that the market for quality labels is larger than the market for free-range and organic pork, and in this sense contributes more to market-driven improvements in animal welfare.

Consumer interest in animal welfare and the role of quality labels can be further investigated by considering WTP for animal welfare as a quality attribute. Hence, if many consumers have a strong interest in, and thus a high WTP for, animal welfare as a single food attribute, one could argue that quality labels are superfluous, and that it would be better to direct all consumer interest in animal welfare into the purchasing of products with premium animal welfare labels rather than quality labels. On the other hand, if many consumers are less interested in paying for pig



welfare than other quality attributes of pork, the quality labels might usefully supplement premium animal welfare labels.

In Mørkbak et al. (2010) consumer preferences for five food attributes were investigated in a choice experiment in which each respondent was presented with nine hypothetical choice sets. One of these attributes was the system of production—specifically, conventional versus ‘alternative’ production (defined in terms of outdoor access, more straw and more space in stall). The additional attributes comprised country of origin, fat content, Salmonella risk and price. It is important to stress that the participants in the choice experiment were asked to consider each food attribute separately. Consequently, the investigation did not claim, nor did it presuppose, any relationship between these food attributes. The results indicated that being produced in an alternative production system was not among the most important quality attributes when WTP was estimated in a hypothetical shopping situation.<sup>2</sup> This can be seen from the results in Table 4.

Table 4 indicates that the WTPs for an alternative production system and reduced Salmonella risk were strictly positive, but that they also had the lowest ranking among the selected quality attributes. To some extent, consumers also connected better animal welfare with domestic production, for which the WTP was considerably higher than alternative production.<sup>3</sup> This result indicates that consumers might have stated an indirect WTP for animal welfare in their WTP for domestic production. Still, the study suggests that animal welfare has low priority compared to the content of fat and domestic production. The relatively low WTP for animal welfare indicates that only a small segment of consumers would have a WTP sufficiently high to match the prices of premium labelled animal welfare products. This interpretation of self-reported WTP accords with the low observed market shares for premium labelled animal welfare pork reported in Table 3. Furthermore, the result indicates that there is a segment of consumers with a WTP for animal welfare that is positive but not strong enough to meet the prices for premium products, and that the demand of these consumers could potentially be captured by a medium welfare product, or by quality labelled products that offer additional qualities.

A number of questions from the Mørkbak et al. (2010) study shed further light on the purchasing motives associated with ‘alternative’ pork and standard pork. Since ‘alternative’ in their study was defined in terms of outdoor access, more straw and more space in stalls, it seems reasonable to suppose that the study may illuminate reasons for purchasing pork from free-range and organic production, but not from quality labels with medium levels of animal welfare. Bearing in mind what the participants usually bought, they were asked to choose 2 out of 13 reasons for buying pork from either conventional or alternative production systems, respectively. ‘Animal welfare’ turned out to be the most important reason for buying pork from alternative production, at 69 %, followed by ‘better taste’ (38 %). The most

<sup>2</sup> The choice experiment and calculation of WTP are explained in Mørkbak et al. (2010).

<sup>3</sup> In the questions investigating why respondents purchase domestic produce, the most common reasons for choosing Danish pork were to support Danish production (50 %), followed by better animal welfare (24 %). Thus, concern for animal welfare may be of some importance as a feature of domestic production.

**Table 3** Animal welfare-friendly products on the Danish market for pork

	Standard	Medium	Premium
Labels	Various	Antonius Den go'e gris (The good pig) Bornholmergrisen (The Bornholm pig)	Free-range Organic
Market share <sup>a</sup>	81 %	12 %	7 %
Overall characteristics <sup>b</sup>	Low price	Medium price Quality/taste Possibly animal welfare	High price Animal welfare—also other quality attributes in the case of organic pork

<sup>a</sup> Market shares for 2012 are based on personal communication with Karl Christian Møller, Danish Crown

<sup>b</sup> Christensen et al. (2014a), Danish Crown (2011); own calculations based on survey data

important reasons for purchasing pork from conventional production were 'low price' (72 %) and 'easy availability' (40 %). The attributes 'animal welfare' and 'better taste', on the other hand, appeared to be rather unimportant when it came to the purchasing of conventionally produced pork (1 % in both cases).

Christensen et al. (2014a) and Danish Crown (2011) both scrutinized the attributes consumers associated with quality labelled pork and free-range and organic pork. The two studies generated very similar results. Both showed that all quality labels were mainly associated with better taste and domestic production rather than animal welfare. In the case of the label 'Antonius,' for instance, Danish Crown (2011) showed that about 47 % of respondents believed that the product was of overall good quality, while 44 % regarded it is a domestic product and 32 % perceived it as tasting good. About 5 % connected Antonius with animal welfare. In Christensen et al. (2014a), Antonius was mainly connected with taste (45 %) and domestic production (31 %), and to a minor extent also with animal welfare—most commonly, in the form of increased space in stalls, which was stressed by 13 % of respondents. In Christensen et al. (2014a), organic pork was mainly associated with environmental benefits (55 %) and outdoor access (44 %). The features most consumers associated with free-range production were that the animals had outdoor access (54 %) and that sows were loose (38 %).

These studies seem to suggest that Danish consumers associate different characteristics with standard, quality labelled and premium animal-welfare labelled pork products: standard products are mainly associated with low price; quality labels are associated with better taste/quality, and to some extent animal welfare; and free-range/organic labelled pork is associated with animal welfare and high prices.

An important issue deserving to be stressed is that the Danish consumers are not always knowledgeable about the content of various labelling systems. In a survey conducted by the Danish Consumer Council (2011b), it turned out that consumers frequently overestimated the measures taken to improve animal welfare under quality-profiled labelling schemes. In one case, as many as 30 % of respondents

believed that the Antonius label indicated free-range production. In Christensen et al. (2014a), only 9 % of respondents believed that Antonius livestock were granted outdoor access, but at the same time only half of the respondents in the survey associated free-range and organic pork with outdoor access. Indeed, for most labels, <20 % of respondents claimed to know the given label, according to Danish Crown (2011). An exception to this pattern was the Antonius label, which was known by about 80 % of respondents. The general problem with poor public understanding of the animal welfare standards connected with quality labelled and welfare labelled products is that this could erode the credibility of these products for consumers.

Price might be another important feature in the assessment of the role of quality labels in market-based promotions of animal welfare. Given the literature on consumer segments and the findings above, it seems likely that quality labels will attract consumers who would otherwise purchase standard pork if the quality labelled products were priced sufficiently below free-range and organic pork.

The prices paid to producers may give some indication of differences in the prices that consumers will ultimately have to pay. Christensen et al. (2014a) found that, compared to standard pigs, the producer receives a premium of 102 % for organic pigs, 38 % for free-range pigs, and 13–14 % for quality labels. Thus, it seems that quality labelled products within the Danish pork market lie ‘in between’ standard products and free-range/organic labels—not only in terms of animal welfare standards, but also price level (Janssen et al. 2009). This indicates that quality labels may have a role to play not only when animal welfare as a food attribute receives relatively low priority among consumers, but also when the prices of products carrying animal welfare labels are deemed too high.

## Discussion

In the Danish market pork from free-range and organic systems of production may indeed signify higher levels of animal welfare than quality labels, as only the former guarantee outdoor access. However, free-range and organic pork are also associated with considerable price premiums. This may discourage many consumers who would otherwise be interested in animal welfare products. The high prices of premium animal welfare products appear to leave room in the market for products with medium levels of animal welfare, such as quality labels, as these are more moderately priced and include quality attributes that may have broader appeal than animal welfare alone. In particular, the integrated research approach adopted here indicated that there is a segment of consumers who are willing to pay for animal welfare but not sufficiently willing to meet the price of the premium products. The demand from these consumers could potentially be captured by a quality labelled products that offer additional qualities including an animal welfare attribute at a medium level of animal welfare. The potential for medium-welfare labelled products or quality labelled products is emphasized by the larger market share quality labels have in the Danish pork market compared with premium welfare labels. So while free-range and organic production can be said to improve animal

**Table 4** Willingness to pay estimates for 500 g of minced pork [mean and standard deviation in Danish kroner (DKK)]

Name of product characteristic	WTP (DKK)	SD (DKK)
Alternative production	8.25	0.81
Domestic produce	27.94	1.17
Fat level 3–7 %	31.35	1.64
Fat level 8–13 %	22.51	1.40
Salmonella risk: 0	12.47	1.08
Salmonella risk: 1 out of 1,000	7.80	1.03

The WTP estimates capture the marginal increase in the WTP of choosing a minced pork product when the given characteristic is present compared with a base level (indoor, produced outside Denmark, Salmonella risk above 5 out of 1,000, and fat more than 13 %)

Source Mørkbak et al. (2010)

welfare significantly for a limited number of pigs, quality labels may bring less significant improvements, but to a larger number of pigs.

A couple of reservations should be mentioned here. First, obviously, it is a general limitation of quality labels, and indeed of labelling schemes as such, that only consumers of pork can influence pig welfare standards through their choice of pork. People who are concerned about pig welfare but do not consume pork are unable to engender improvements through their food choices (McInerney 2004). This naturally limits the effectiveness of market-based initiatives. It is also important to bear in mind that 90 % of the Danish pork is exported (Christensen et al. 2014a). This obviously means that the consumption of pork from quality labels or free-range/organic production on the Danish market will have very little influence on Danish pig production as a whole.

Second, NGOs in Denmark such as The Danish Consumer Council have criticized the animal welfare standards imposed by quality labels for being only slightly better than those in standard pork production—not least in light of recent legally imposed improvements of the welfare of pigs in standard production. For instance, quality labels used to be differentiated from standard production by their guarantee that sows were free to move around during most of their pregnancy, but the EU has passed legislation which makes this a requirement for all pigs from 2013 (Christensen et al. 2014a). And although the ban on fully slatted floors is currently a distinguishing feature of quality labels, from 2015 this ban will apply to all pigs farmed in Denmark (Danish Pig Research Centre 2011). There is therefore a need to revitalize the animal welfare standards for quality pork products if they are to continue to contribute significantly to market-driven improvements in animal welfare.

Third, the potentially positive role of quality labels in promoting animal welfare may also have to be weighed against the confusion, or even resignation, of consumers when they are confronted with new varieties of labelling schemes. Our analysis indicates that there is already a degree of confusion among Danish consumers about the content of the different pork labels, just as the majority of consumers are unfamiliar with several quality labels. The confusion is not specific

to Danish consumers, but is found throughout Europe (European Commission 2005). A serious problem would arise if consumers were to start mistaking quality labels for free-range and organic products—and would be even more serious if the contribution of quality labels to improvements in animal welfare is in any case insubstantial. The latter case may be viewed as ‘greenwashing’, where consumers are deceived into believing in the animal-welfare benefits of a product (Lewis et al. 2008; Borkfelt et al. 2013).

These considerations lead to one of the most basic requirements of a successful labelling scheme: trustworthiness (Krystallis and Chryssohoidis 2005; Gellynck et al. 2006; Pivato et al. 2008). Proper discussion of the ways in which trust and confidence in animal welfare labels can be built lies beyond the scope of this paper. However, lessons can be learned from other markets where different ways of obtaining public trust in products with improved animal welfare have been used.

The Danish Animal Welfare Society only approves premium animal welfare labels. However, a different strategy seems to be used in other countries such as the United Kingdom, The Netherlands and Germany. In these countries, medium levels of animal welfare, including improved indoor conditions, can also be certified as animal welfare improvements by national animal welfare associations. This approach provides the consumers with choices of raised levels of animal welfare certified by animal welfare associations in the respective countries. For example, the Freedom Food labels in the United Kingdom, set up by the Royal Society for the Prevention of Cruelty to Animals in 1994, operate with four categories; certified indoor, outdoor bred, outdoor reared and free-range (Freedom Food 2014). Freedom Food certifies almost one-third of the pork production in the United Kingdom (Freedom Food 2013).

In The Netherlands, Beter Leven has since 2007 operated with a three-star animal welfare label certified by the Dutch Society for the Protection of Animals. In pork production the first star guarantees improved indoor conditions, the second star guarantees, among other things, access to outdoors areas, and the third star guarantees animal welfare conditions equivalent to organic standards (Beter Leven 2014). It is estimated that 40 % of the pork sold in The Netherlands is labelled with at least one Beter Leven star (Ministerie van Economische Zaken 2013).

In Germany, two very similar labels were introduced in 2013: the Tierschutz-label (Tierschutz 2013) and the Vier-Pfoten-label (Vier Pfoten 2014). These were certified by their respective animal protection societies. Both labels operate with two levels of animal welfare which, roughly speaking, guarantee improved indoor and outdoor production, respectively. The schemes were introduced only a few years ago and currently have very limited market shares.

In all of these countries the pork products with premium levels of animal welfare, such as organic and free-range pork production, are limited to relatively low market shares. In Denmark, medium level animal welfare products are exclusively sold as quality labelled products that fall under the supermarkets’ private labels and are certified by the label owner. The success must be considered limited here, with market shares of 12 %. A look at the relatively successful experiences, in The Netherlands and the United Kingdom, with medium levels of animal welfare certified by an animal protection association suggests that a similar system could

improve market shares of medium level animal welfare products in Denmark. Whether the German initiative, with medium levels as well as premium levels of welfare certification, will be successful will be interesting to see. The limited market impact of animal-welfare labelled pork in Germany is possibly a result of the structure of the German market, where about 70 % of pork is sold at discounted prices, and where there is strong competition between retailers (personal communication Lars Schrader, Federal Research Institute for Animal Health, Germany).

Successful national animal welfare labels do not necessarily demonstrate that a similar EU-wide label would improve market shares in other countries. This is due to national differences in the perception of animal welfare. Just to mention a few differences, banning castration of male pigs is included in the medium levels of animal welfare labels in the United Kingdom, The Netherlands and Germany, but it is not even included in the premium level of animal welfare labels in Denmark. In addition, 40 % of the sows in the United Kingdom are 100 % free-range (and thus not confined while farrowing and suckling). In all other countries, free-range sows are guaranteed only by the premium levels of animal welfare labels (free-range and organic production systems).

There are also lessons to be learned from private labels in other European countries. The use of private labels has exploded over the last few decades, and it is now common for supermarkets to offer, not only their own discount label, but also a premium level of private label which competes with traditional brands (Hansen 2012). As can be seen in The Netherlands and the United Kingdom, animal welfare might be one of the additional qualities guaranteed by supermarkets' private labels. In particular, a tripartite pork market is recognized in these countries. So, for example, the largest supermarket chain in The Netherlands, Albert Heijn, offers three lines of pork within their private brand which are linked to the three stars of Beter Leven. The three lines seem to be distinguished primarily by their animal welfare requirements. In the United Kingdom, the biggest supermarkets, such as Sainsbury's, Tesco, Asda, Morrisons, Waitrose and Marks & Spencer, have their own labels in discount as well as premium qualities. The supermarkets differ significantly, though, in their emphasis on animal welfare. For example, Waitrose and Marks & Spencer brands include outdoor bred or outdoor reared fresh pork exclusively. Tesco and Sainsbury guarantee that fresh pork in their premium series ('Tesco finest' pork and 'Sainsbury's taste the difference' pork) is either outdoor bred or outdoor reared, whereas the premium brand in Asda ('Asda Extra special pork') guarantees that fresh pork is Red Tractor labelled, which only guarantees a level of animal welfare slightly above the legal minimum. Again, the largest supermarket chain in Germany, Edeka, operates with three lines of products ('Edeka', 'Edeka Gut & Gunstig', and 'Edeka Organic'). In some of the larger cities 'Edeka Premios' pork is also sold, and this carries the animal welfare label Tierschutz at a medium level (Aktiver Tierschutz 2012).

In all cases, the marketing of pork with improved animal welfare characteristics is combined with the promise of a better taste, and consequently the pork products with medium levels of animal welfare can be categorized as quality labelled products in the sense used here. Experience in The Netherlands and United Kingdom seem, then, to support the hypothesis that there is a role for quality labels

with medium level animal welfare, as they reach consumers in market segments who would probably otherwise have chosen standard pork.

Furthermore, our study suggests that a quality label is likely to be more successful if it includes a certified level of animal welfare set at medium level. The reasons for this are that certification increases the visibility of the animal welfare attribute and increases trust in the animal welfare attribute being delivered.

We believe our findings might be of interest in other contexts where market-based approaches to animal welfare, and particularly the role of quality labels, are being discussed. In these discussions there might be a need to consider, not only the importance of labelling schemes strongly focused on animal welfare, but also labels that involve animal welfare on a more modest scale, embedded in broader quality concepts.

This kind of labelling may be especially important in markets for other meat products (notably chicken and other forms of poultry) where free-range/organic products are typically priced significantly above the standard products, since here it might be important to attract price sensitive consumers who would otherwise purchase standard products (Christensen et al. 2014b). As meat products may differ in numerous ways, quality labels may also attract consumers who are not solely focused on animal welfare. As a corollary, our findings might be somewhat less relevant to markets where products with animal-welfare benefits are relatively cheap (an example is organic milk in Denmark) and where welfare features are harder to bundle with various gustatory qualities (such as animal welfare-friendly eggs) (Heerwagen et al. 2013).

## Conclusion

In Denmark there are external certification schemes in place for premium pork in terms of organic pork and free-range pork. By contrast, quality labels with medium levels of animal welfare standards are certified by the label owner. Our analysis of the Danish market for pork, and the comparison we have made with experience in The Netherlands, Germany and the United Kingdom, suggests that policy makers may currently have an interest in maintaining markets for medium levels of animal welfare as well as premium levels of animal welfare in order to meet the diverse demands of the consumer. By including two or more certified levels of animal welfare it should be possible to attract more than one consumer segment. The medium level of animal welfare may or may not form part of a broader quality label.

Supporting quality labels with a medium level of animal welfare might well bring about improvements in animal welfare if two conditions are met: (a) the production under quality labels substantially improves animal welfare; (b) there is a consumer segment with a positive, though not a strong, interest in animal welfare as an individual food attribute who would otherwise be inclined to purchase standard products.

The limitations of labelling schemes mentioned above indicate that they cannot stand alone in securing improvements in animal welfare standards. Legislation will always be needed to secure at least a minimum level of animal welfare for pigs.



That said, the increased use of reliable and trusted labels for animal welfare-friendly pork products has the potential to raise levels of pig welfare in the future.

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