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Literature review - WP1 & WP2 - Citizen and consumer attitudes

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Content

Introduction

The aim of this literature review was to identify and evaluate published work on citizen and consumer attitudes to animal welfare in the pig sector, with specific attention to the housing of sows during farrowing, and to lactating sows. The following themes and questions guided the review:

Animal welfare – How do people understand the concept of animal welfare, and what are the perceived links between different production systems and animal welfare?

Confinement – What do we know about people's attitudes to: sow stalls (meaning: individual crates for sows), the importance of space allowance, freedom of movement, outdoor access, and other factors related to confinement of sows?

Quality – What role does animal welfare play in relation to other societal and product-related attributes, or qualities, and what values are important in this quality distribution?

National trends – What national tendencies can be detected in research into animal welfare and its importance to the consumer?

The literature search criteria applied were as follows: all publications are peer-reviewed, articles in English from international journals, from the period 2000 to the present; all include qualitative or quantitative empirical findings; all discuss animal welfare in relation to pigs (or in a few cases in relation simply to a non-specific species of animal yielding marketable meat produce). It is acknowledged that this excludes so-called "grey literature" (such as working papers and reports) which often contains background studies and information about research undertaken prior to that reported in peer-reviewed publications. Literature reviews have led to relevant cited publications, and a few references to relevant reviews occur.

The search process specifically focused on the Danish market, but it also took in export markets relevant to the Danish pig production. This meant that research conducted in Europe, the US, Russia, Japan, China, and Australia is of special interest. The publications evaluated here are mainly European, with some American and a few Chinese papers, due to the limited amount of relevant work conducted in the remaining countries.

The literature study proceeded from a thorough reading of relevant publications; this stimulated enquiries about further interesting literature. The study is based on constant reinterpretation, and on an iterative process of moving back and forth between particular texts and the whole body of literature. The process is potentially never-ending, but a point of saturation may be reached when additional papers make only marginal contributions to further understanding.

The market-related literature included in the study is limited to cover stated preference analyses. This means market behaviour has not been included. Studies of market behaviour have the great advantage of being based on observed behaviour and therefore do not suffer from the same methodological biases as stated data do in terms of strategic answering, hypothetical bias, selection bias, and so on. This being said, it should be noted that market studies are restricted in four important ways: 1) they are confined to the examination of product-related animal welfare issues; 2) they analyse only existing products; 3) they are limited by the availability of relevant data; and 4) they provide information about what is bought, but not why. In short, market analyses and stated preferences analyses each have a role, or purpose, but given the aims of the present literature study, a study of stated preference literature was appropriate.

The paper is organized as follows. First, a summary of the findings is provided. Second, the literature study itself is presented, following the structure dictated by the themes, which were: animal welfare, confinement, quality (here treated under a section on consumers' willingness-to-pay) and demographics.

Summary

This literature study aimed to identify and evaluate published work on citizen and consumer attitudes to animal welfare in the pig sector, with specific attention to the housing of sows during farrowing, and to lactating sows. It is important to keep in mind that attitudes and behaviour relating to animal welfare are linked to perceptions – specifically to perceptions of "scientific facts". This can be a cause of frustration, of course.

The general picture is that animal welfare – including sow stalls on farms – is of concern. There is no doubt that good animal welfare is connected in people's minds with many different things, and that a large variety of benefits (ranging from better eating quality to ethical gains) are associated with animal welfare issues. More knowledge is needed, though, about the extent to which these preferences are active (i.e. spring to mind) or latent (existing when brought to mind). Another question that has only been lightly investigated is about the extent to which it is possible to motivate consumers to pay more for additional welfare attributes in pork, either in farmer subsidies or at the supermarket via price premiums – and, in particular, animal welfare relating to loose-housing for sows.

Our findings are organized around four themes:

Animal welfare – *How do people understand the concept of animal welfare, and what are the perceived links between different production systems and animal welfare?*

Animal welfare is perceived as something positive, and as something at risk in modern animal production. Often the precise meaning of the words "animal welfare" is not defined.

Some studies link animal welfare to the living animal, but the majority focus on animal welfare as a component of meat. This component could emerge either as something affecting other qualities ("happy pigs taste better") or as a distinct quality ("I only eat happy pigs"). It is mentioned in the literature that the focus on meat may encourage perceptions of farm animals as well-produced food commodities rather than well-treated farm animals. Whether this change in focus has had a positive or negative effect on initiatives to improve animal well-being remains to be seen.

We do see, however, that a potential pitfall arises from linking animal welfare with meat, because once this link is made analyses are restricted to capturing the value that one person might attribute to the welfare of an animal purchased by that person. A product-related value cannot capture one person's valuation of the welfare of animals providing meat that other people eat.

For citizens, the most important aspect of animal welfare, as is repeatedly stated, is naturalness – a feature involving associations with space and outdoor access, but also with romance, countryside landscapes, small farms, and so forth. As a consequence, citizen perceptions of animal welfare can be linked with particular types of production according to their naturalness, and thus whether aspects like space and outdoor access feature in the production practices. For producers, animal welfare is typically linked with animal health and productivity. For food scientists, it is typically connected with characteristics of the meat such as leanness, texture, taste and colour. It is noteworthy that both consumers and producers have also been found to regard a good animal life as one involving a balance of freedom, care and economic considerations.

Commercials and information campaigns from the agricultural sector seem to add to images that link animal welfare with naturalness – and it could be argued that such actions add to the gap between actual and perceived agricultural production practices and thus prepare the ground for media "revelations" of the real agriculture.

Confinement – *What do we know about people's attitudes to: sow stalls (meaning: individual crates for sows), the importance of space allowance, freedom of movement, outdoor access, and other factors related to confinement of sows?*

Confinement generally seems to be considered a negative feature that threatens animal welfare. A number of studies have found that citizens value space more highly than group size. A study of US citizens found that sows being kept in individual gestation stalls were preferred over a housing system involving group pens – if the space per animal was identical.

Along similar lines, stocking density is not a vital concern on its own, but it becomes a concern when it is associated with lack of space and freedom to move, which are issues of concern.

Sow stalls seems to be one of the main concerns in pig production. The robustness of the results here, however, does need to be tested more carefully, since it is necessary to identify the informational settings in which they were obtained.

Quality – *What role does animal welfare play in relation to other societal and product-related attributes, or qualities, and what values are important in this quality distribution*?

Preferences depend on the setting in which they are elicited. To illustrate, animal welfare seems to be considered less important when compared with other societal issues but very important when no other societal issues are studied. Stocking density, similarly, is a serious concern when no other animal welfare issues are studied.

The importance of the settings is highlighted again in a US study in which strong support (69% of respondents) for the banning of gestation crates was significantly reduced (to 31% of respondents) when taxes had to be raised to secure the ban.

A common – and important – finding is that a large proportion of consumers believe there is a link between high animal welfare production and meat quality. A good example of this is a study involving Italian, British and Swedish consumers which found that consumers took good animal welfare to improve the taste of meat and improve human health (among other things). The authors conclude that animal welfare-friendly products possess a number of attributes in the minds of consumers with benefits beyond the mere utility of animals.

Buyers of organic food products are found in several studies to be more likely to be concerned about food-related ethical issues – e.g. animal welfare, environmental impacts, and ethical trading – than non-buyers.

All of the willingness to pay (WTP) studies identified appeared to report positive WTP for animal welfare attributes. Of particular interest is an American study that found a positive willingness to pay a price premium for pork produced without gestation crates. In another study, Canadian consumers were found to be willing to pay a premium for pork products deriving from outdoor-reared sows and for pork from sows kept in indoors in groups.

A Danish study ranked animal welfare as just one of several attributes of minced pork. In decreasing order, price, country of origin, fat, safety aspects were found to be more important than animal welfare in hypothetical settings. Hence, animal welfare was well down the list of important food attributes.

WTP was found to be positively correlated with knowledge of production practices and concerns about animal welfare.

National trends – *What national tendencies can be detected in research into animal welfare and its importance to the consumer?*

Consumer trust in northern European countries, such as Britain, France and Germany, on the one hand, and southern European countries, like Italy and Spain, on the other, has been found to differ. Thus higher levels of trust in farmers to secure freedom of movement for their animals,

keep them in stables that are inspected at least once a day, and provide them with a balanced diet, were found among respondents from Britain, France and Germany. The trust was directly linked with a willingness to pay a premium price for certified animal-friendly products. The differences between these parts of Europe may be due to the marketing information systems in northern Europe, which are generally rated more trustworthy than those in more southerly countries.

In a European study conducted in 2007 nearly all respondents in Italy, Sweden and Britain were found to be concerned about animal welfare, but slightly more than half of them did not feel as well informed about animal welfare issues as they would wish to be. In all countries the majority of respondents were reluctant, when eating meat, to think of it coming from a live animal; nor did they think of animal welfare when purchasing meat. This is an example of cognitive dissonance.

A comparison of survey data from nine European countries (Great Britain, Finland, Ireland, Lithuania, Malta, The Netherlands, Poland, Portugal, and Spain) indicates that access to information on the conditions under which animals are farmed has a significant positive impact on behaviour in terms of willingness to change shopping venue to buy animal welfare friendly animal products in all countries.

Another European study of consumer attitudes to pig production includes Belgian, Danish, Polish, and German consumers. It indicates that consumers from Denmark and Germany favour socially responsible types of pig farming (small, local, animal-conscious, and offering benefits to consumers in terms of healthiness and quality) more than their Belgian and Polish counterparts. In this study four types of consumer are identified:

- (17% of respondents): *Environment-conscious citizens* who support medium- and large-scale pig farming; from all countries (mostly in Poland and Germany); better educated and better off financially; take a rather pessimistic view of the pork industry's environmental effects.
- (59% of respondents): *Indifferent and average citizens* (mostly in Belgium and Poland); have the weakest attitudes to environment, nature, and animal welfare; the highest percentage of regular pork eaters.
- (12% of respondents): *Animal welfare-conscious citizens* (mostly in Germany and Denmark); the least urban, more women, fewer highly educated people, on lower incomes; more in favour of certain large-scale pig farming practices.
- (11% of respondents): *Small-farm supporting citizens* (mainly in Denmark and Germany); the most pessimistic attitude to state of environment, nature and animal welfare; and the second strongest attitude to the need for environment-friendly food production.

The same authors include Brazil and China in a follow-up analysis. Across all three continents, consumers' attitudes to the environment, and to nature, animal welfare and industrial food production, turned out to be on average rather/moderately strong. In Brazil very similar consumer

clusters were found as those identified in the European countries. In China the focus on food safety was much greater than that on animal welfare and the environment. The authors concluded that people with stronger opinions about ecologically shaped and socially acceptable food production also tend to belong to clusters in which there are stronger opinions about pig production systems, and vice versa.

A recent quantitative survey of students in 103 universities in Europe and Asia found that the perceived sentience of chickens was among the lowest of any animal species included in the investigation. In a Eurobarometer study the conditions for laying hens were judged to be worse than those for pigs and dairy cows, and both laying hens and broilers were the species that respondents believed to need most welfare improvement. As noted in the study, these findings might indicate that lower standards are more likely to be tolerated for chickens than for other species.

Another European study analysed differences in perceptions of hen welfare. It found that Swedish consumers were the least negative about welfare conditions for hens, while British consumers were the most negative. When it came to pigs, British consumers were more positive about pig welfare than consumers in Italy and Sweden. These differences in perceptions might have been influenced by animal protection campaigners, and by how common it was for respondents to witness pigs being raised outdoors in each of the countries.

Finally, we note the two strikingly contrasting findings about the Swedish respondents' attitude to animal welfare and animal rights here: according to the authors, this was possibly due to differences in questionnaire focus and in national legislation, i.e. Swedish respondents may be more inclined to view practices as acceptable because they are confident that animal welfare is adequately controlled.

Animal welfare

Operationalization

Consumer-citizen attitudes to animal welfare depend on a wide spectrum of values, interests, experiences, and so forth, and there is at best limited agreement over how to define the concept. Different species and contexts evoke different attitudes; wild animals, laboratory animals, companion animals and production animals are all attributed with a wide variety of subjective meanings. It is therefore crucial to specify clearly the context in which attitudes are being elicited if we are to obtain an accurate and nuanced understanding of the attitudes under examination. Nevertheless, we find that there is a remarkably little attention to the importance of context in studies of attitudes and values related to animal welfare reported in the publications included in this literature study.

A surprisingly large number of analyses claiming to study animal welfare simply seem to take a conceptualization of welfare for granted; they lack a definition, or at least discussion of the matter. As a consequence the obtained findings are not very precise. When definitions are included in the studies, they often make non-critical reference to the "Five Freedoms" (Cerjak et al., 2011, Tuyttens et al., 2010, Prickett et al., 2010), the Treaty of Lisbon (Cziszter et al., 2011), or the EU project Welfare Quality (Vanhonacker et al., 2007). Terms such as "animal welfare", "animal-friendly production", "animal-friendly practice" and "animal welfare standards" (by which are meant *high* standards) seem to be used interchangeably.

Furthermore, there is often a seriously concerning failure to reflect upon, and discuss, the consumer-citizen discrepancy. However, the objective of this literature study is not to judge whether the *articulations* of the people contributing in the empirical settings are in compliance with the actual context and participants in question. Terms deployed in the specific publications will therefore be loyally reused, without adjustment for the potentially incorrect portrayal of both participant and context.

It is noteworthy, also, that only a few of the studies seek to obtain a deeper insight into consumer-citizen attitudes to the welfare of the *living* animal. The more or less explicit objective of the majority of publications is rather to examine animal welfare as a product quality among other product-oriented qualities in a search for marketing opportunities. This means that the concept of animal welfare is operationalized in relation to meat, not the animal (Ngapo et al., 2003; Mayfield et al., 2007; Lind, 2005). An exception is Skarstad et al. (2007), who specifically studied different perceptions of animal welfare in Norway in focus group interviews. They conclude that a key aspect of animal welfare is that farm animals are living beings, not just food. In their study, consumers evinced a romantic view when imagining good animal welfare, emphasizing a close and caring relationship between farmers and their animals. Participants in the study also expressed a

strong desire to eat meat with a clear conscience, i.e. meat from animals accorded freedom when alive.

The dominant way of reasoning about animal welfare, and one that seems to be shared among the more end-product orientated perspectives on animal welfare, focuses on the aim of avoiding suffering, as distinct from other philosophical views of good animal life. When the avoidance of suffering becomes the main goal – and not pursuit of natural behaviour, the enjoyment of social goods, or even happiness – achievable animal welfare can be seen as something to be measured against suffering-avoidance criteria. This animal welfare concept, which prevails in product-related consumer studies, is too narrow when the goal is to compare citizens' attitudes to animal welfare with their attitudes to other values associated with such things as specific animal welfare improving initiatives, the transition from animal to meat, and understanding of the potentials and limits of market driven animal welfare.

Based on the literature reviewed, we conclude that there is indeed a need both for wider recognition of the competing definitions of animal welfare and more reflective discussion of this matter.

Naturalness

First and foremost, animal welfare is often articulated in value-laden terms, and it often seems to be based on visual images of farming and "natural" living conditions. An idyllic image of animal production in the countryside seems to characterize broader citizen attitudes to farming in general, and this image is often experienced as the antithesis of intensive pig production. Expressions such as "happy pigs" (which are described as being satisfied, calm, relaxed, curious, grunting and running pigs) (Lassen et al., 2006 & Boogaard et al., 2011) and "living as close to nature as possible" (Skarstad et al., 2007) are often pressed into service when animal welfare is characterized.

The underlying perspective of some processes of attitude formation largely revolves around animal sentience and cognition, and ways in which animal welfare relates to normative questions about justice and rights. In this vein, for example, we encounter statements such as "The way animals are treated is inhuman" (Te Velde et al., 2002, p. 211) and "I don't like to see any of the intensive systems for animals. Humans need their space and so do animals" (Schröder & McEachern, 2004, p. 171). Along similar lines, Te Velde et al., 2002; Skarstad et al., 2007; Prickett et al., 2010) find that farm animal welfare is associated with freedom to exhibit natural behaviour, to live in a natural way, and to satisfy natural desires.

Several studies have found that different stakeholders characteristically hold different perceptions of animal welfare. Boogaard et al. (2011) show that the focus on naturalness is more prominent in citizen attitudes than it is in the attitudes of production scientists and farmers. Citizens' definitions

of animal welfare seem to be broader than those of other stakeholders. They also involve the idea that, beside physical well-being, a certain kind of mental well-being is important: “animals have to feel good” (Te Velde et al., 2002). Through a series of stakeholder interviews revealing perceptions of, and attitudes to, animal welfare in the Netherlands, Bracke et al. (2004) support these findings: they conclude that producers tend to focus on technical (re)production parameters; that the notion of good animal welfare is translated into the idea of productive animals, which presupposes that animals with high production rates cannot have poor welfare. Citizens (including animal welfare protection advocates) have a much more emotional perception on animal welfare – one based on their personal experiences and on images of traditional farming. Scientists tend, ultimately, to judge welfare on the basis of what can be measured, often referring to physiological and behavioural parameters. Vanhonacker et al. (2008) found that in Belgium citizens’ and farmers’ view of current production practices in general diverge: citizens frequently have a negative impression of those practices, while farmers evaluate production much more positively. In relation to this, citizens occasionally lean towards the accusation that modern intensive pig production systems tolerate lower levels of animal welfare than small, extensive, family-owned farms (Ngapo et al., 2003, Schröder & McEachern, 2004, Vanhonacker et al., 2010).

The “naturalness” that is, arguably, excessively important to citizens is often linked with specific housing systems and production practices. In particular, space and outdoor access appear to be considered the two most important qualities in a “natural” life affording an acceptable level of welfare. Vanhonacker et al. (2009) found that in Belgium spatial aspects like the available space, pen size or cage size are perceived as more important than group size. When discussing what natural behaviour is citizens often refer to the freedom to move around, the opportunity to go outside into the pasture, the freedom to root, to play, to sleep in a natural rhythm, to lie in the mud (for pigs) and to give parental care (Boogaard et al., 2011). Thus freedom of movement is a very important aspect of animal welfare when that is conceived of as living a “good” and “natural” life.

Because of the criteria of exclusion applied in this literature review, and because the main focus is pig production, we have not analysed in detail whether, and to what extent, there are species-specific differences in the values associated with different kinds of animal. However, a few studies do address this issue. Phillips et al. (2012) present data from Eurobarometer (EC, 2005a; 2007a) showing how the welfare and protection of farmed animals are judged differently in different species. Conditions for laying hens and broilers were judged by European citizens to have the highest level of welfare problems, and as the basis of the greatest need for protection. This finding is also evident in Mayfield et al. (2007) and Verbeke & Viaene, (2000). At the same time, other indicators show that pig production raises more welfare issues than either dairy (Boogaard et al., 2011) or poultry production (McCarthy et al, 2004).

Several focus group interviews have found that citizens include an economic perspective when discussing animal welfare and acknowledge the producers’ dependence upon efficient production

technologies that impose some cost on animal welfare (Skarstad et al., 2007; Boogaard et al., 2011; Lassen et al., 2006; Ngapo et al., 2003). This points to ambivalence about contemporary animal production as it is seen from the citizen's point of view. On the one hand, naturalness is appreciated as an important welfare attribute referring to the animal's dependence on, and necessary interactions with, nature and preferred independence from human involvement. On the other, respondents see the point of certain aspects of modernity, including hygienic farming practices (Vanhonacker et al., 2009), efficiency and productivity (Boogaard et al., 2011), air quality and barn temperature (Vanhonacker et al., 2008). This ambivalence is also expressed in discussions of who should be responsible for securing an acceptable level of animal welfare. Vanhonacker et al. (2010) report that while Belgian citizens think they themselves are partly responsible, they also believe that the government has an important responsibility for labelling, welfare-monitoring, and the disbursing of subsidies. They believe that responsibility here does not lie solely with one actor; they also agree that there is a need for more general awareness and a changed "mentality", i.e. a reassessment of the way we think of animals.

Confinement

Associations between animal welfare and housing practices tend to revolve around space and confinement. Lack of space is one of the things most frequently condemned by animal welfare organizations – and in sympathetic coverage in the media. It is also one of the most tangible and visible features of animal production systems (Vanhonacker et al., 2009). Thus reductions in stocking densities and increases in pen size (both space-related initiatives) are often regarded as essential if a level of farm animal welfare that citizens find acceptable is to be attained (Boogaard et al., 2011; Vanhonacker et al., 2008; Vanhonacker et al., 2009). Indeed, Vanhonacker et al. (2009) find that perceptions of spatiality (via ideas and images of, and expectations about, available space, pen size and cage size) are especially important in public perceptions and citizen concern relating to stocking density. This is more important than the perception of group size, i.e. the number of animals housed together. Consequently, Vanhonacker et al. (2008) recommend focusing marketing and image-improving efforts on enlarged pen size rather than group size.

Boogaard et al. (2011) note that when it is stated that stocking rate is the main concern of the citizen, explanations of this are offered primarily in relation to lack of space and restrictions on freedom of movement.

Many studies focus on consumer perceptions of single measureables, such as stocking density and space allowance, and this may be misleading because a positive change in a single measureable factor can fail to improve animal welfare if other improvements are not integrated simultaneously. Furthermore, these single production measurements are often interrelated. We find that in most of the literature reviewed where consumers are actually asked to prioritize different measureable dimensions, the interrelation of those dimensions is not systematically addressed. This issue is primarily seen in quantitative research, and this research is therefore at risk of drawing a simplistic, narrow picture of consumer priorities.

For example, Martelli (2009, p. 33) uses results from a Eurobarometer questionnaire (EC, 2005b) to sum up the factors that are “very important” in consumer perceptions of animal welfare. Listed in decreasing order of importance, these are: “space allowance”, “humane transport”, “presence of trained staff”, “humane slaughtering”, “access to outdoor areas”, “exposure to natural light”, “absence of movement restriction by chains or tethers”, “expression of natural behaviours”, “absence of mutilation”, and “social contact”. This ranking of welfare attributes illustrates the difficulty of interpreting results and the need to analyse the attributes in a manner allowing for their interdependence. This is especially clear when we consider ability to express natural behaviour, access to outdoor areas, and space allowance. These attributes are difficult to separate and will probably be perceived as overlapping features by the consumer. For instance, the prioritizing of “space allowance” over “natural behaviour” might be based on an assumption that the latter includes the former. Also, respondents may think of “naturalness” in rather broad terms,

i.e. as an aspect of living a natural life, whereas the meaning of "natural behaviour" is quite specific and might refer to one of the conditions for a natural life.

Furthermore, in the analysis of different valuations and rankings of welfare attributes close attention must be paid to the specific context in which the data were obtained, and to the issue whether recent scandals, marketing campaigns, media coverage and the like could have exerted an influence. Martelli (2009) refers to an Italian report by Miele & Parisi (2001) in which the most important attribute of animal welfare was found to be the quality of the animal feed, followed by the animal's access to the outdoors, the amount of space it has, its freedom to behave normally, the conditions of transportation, and the conditions in which it is slaughtered. Here the priority given to the feed quality was likely to be due to the BSE outbreak, which strongly affected consumer behaviour (Martelli, 2009). The impact of food crises was also apparent in a study by Vanhonacker et al. (2010), which undermined the Belgian public's trust in current livestock production, and which examined aspects of farm animal welfare including "free of synthetics/antibiotics" and "no preventive medication".

Further studies enquiring more deeply into what people associate with different descriptions of pig/sow welfare, and in what kinds of context, might indeed be very useful.

Sow stalls

Two studies investigating outdoor access and sow stalls were identified. A focus group interview conducted in the Netherlands found that the participants were particularly concerned about the confinement of sows and felt it was important, especially for sows and piglets, to have an opportunity for movement, spacious farrowing pens and the freedom to choose to go indoors or outdoors (Boogaard et al., 2011). Boogaard et al. (2011) also found that the outdoor setting was perceived as a more natural environment giving the pigs freedom to move, fresh air, daylight, and the ability to be in groups and, later, to take care of their offspring. Lagerkvist et al. (2006) found that Swedish consumers place high value on allowing especially fattening pigs to be outdoors, and in addition strongly oppose sow stalls. Lagerkvist et al. (2006) also found that the type of housing system for fattening pigs is perceived as more important than castration, and that tail biting is viewed as a more important animal welfare problem than tail docking.

Looking at the general changes in livestock production in recent decades, Prickett et al. (2010) regard the most important developments as the widespread adoption of confinement in production facilities and increased consumer concern about the well-being of farm animals. These diverging developments have recently led to a ban on the individual housing of pregnant sows in Arizona, Florida and California, although our knowledge of consumer attitudes to animal welfare is primarily based on research in Europe.

Prickett et al. (2010) present the results of a telephone survey of US households focusing on consumer preferences on farm animal welfare and the relative desirability of alternative animal production practices. The study shows that consumers support sows being kept in individual stalls instead of groups (partly because they injure each other), but they do not approve of the fact that gestation stalls prevent natural behaviour, such as rooting, and offer no outdoor access. Furthermore, the consumers stated that they do not want low prices at the expense of animal welfare. The authors conclude that consumers prefer pasture systems that include access to shelter over confinement facilities; if a confinement facility is to be used, consumers prefer gestation stalls over gestation pens, provided both provide the same space per sow. To interpret and understand these results, it would be necessary to know precisely what types of information the consumers were provided with in the study.

Another batch of questions in Prickett et al. (2010) revealed that there was significant disagreement among consumers over whether the opportunity to perform natural behaviour was more or less important than the provision of basic requisites, such as food and water, and treatment for injuries (p. 345).

Other studies in the US specifically on gestation stalls have been conducted by Tonsor et al. (2009a, 2009b). The latter of these papers presents some interesting reflections on the importance of politics and the general lack of focus on the relevance of legislation in most consumer studies. Consumer studies which attend exclusively to people's attitudes to production, or products, and to correspondences between values and behaviour, overlook the great influence on attitudes and behaviour of consumer views on political initiatives and legislation. To remedy this oversight, Tonsor et al. (2009b) examine information about consumer perceptions, preferences and voting behaviour in relation to pig production via a national quantitative survey of US consumers. They focus on consumer attitudes to gestation crates. Their findings suggest that 69% of American consumers support a gestation crate ban when asked in a typical ballot setting. Strikingly, however, when respondents were told that income tax would rise if the ban was passed, support fell to 31% (p. 497). Tonsor et al. (2009a) aims to provide a better understanding of consumer preferences relating to alternative pork production techniques by including the importance of preferences for farm size and country of origin in their assessment of valuations of gestation crate use. They find that preferences for small farms (smaller than about 75% of the pork production practices in the industry) are positively correlated with preferences for pork produced under a gestation crate ban or produced by farmers voluntarily not using gestation crates. This means that respondents treat farm size attributes as partial substitutes for the use of gestation crates, because they associate gestation crate-free production with small farms.

Tonsor et al. (2009a, p. 724) work on the basis that a gestation crate ban will enhance consumer welfare, in the presence of transparent labelling, if and only if consumers' willingness to pay for a "gestation crate ban for pork" exceeds their willingness to pay for pork "labelled gestation crate-free". Their results suggest that if a consumer is provided with adequate labelling of pork

produced on farms certified to be voluntarily refraining from using gestation crates, there is inadequate economic support to justify a ban on the use of gestation crates on the grounds of improving general consumer welfare. However, the findings imply that the swine industry may benefit by encouraging additional labelling of products originating from producers who voluntarily choose not to utilize gestation crates.

Animal welfare as a quality attribute

Product-oriented perspectives

Many of the studies investigating public perceptions of pigs and the pig industry focus on meat and consumption and not on the animal as a living being. The notion of "quality" in relation to food is primarily defined in terms of individual preferences for product attributes like taste, health, safety and leanness. Quality is only occasionally presented as a cultural, political or social construct. At the same time, in much of the literature reviewed the live animal and conditions of production appear to be an underlying topic, even if there is no further examination of the links between meat attributes and animal welfare attributes.

Perceptions of quality vary from consumer to consumer, and also depend on the type of stakeholder. For example, food scientists tend to consider anything measurable, including as pH, colour, and chemical composition, while consumers tend rather to focus on healthiness and convenience, but also on production process characteristics such as environmental and animal welfare issues (Napolitano et al., 2010).

Animal welfare as a credence attribute is supposedly not directly experienced while eating. Nevertheless, the information (Napolitano et al., 2010), stories and emotions connected with welfare-enhanced meat can be very important when we are evaluating animal welfare as just one quality among others.

In many cases animal welfare is operationalized as an explicit meat product quality attribute to be examined along with other gustatory or sensory qualities such as taste, flavour, tenderness (Cerjak & Mesić, 2011; Krystallis et al., 2009; Lagerkvist et al., 2006; Ngapo et al., 2003; Tawse, 2010). In some studies, however, animal welfare is additionally placed as a quality attribute alongside very different types of quality parameters, including: safety and product origin (Vanhonacker et al., 2010); healthiness and freedom from harmful substances (Verbeke & Viaene, 2000); environmental issues (Izmirli & Phillips, 2011); and the use of genetic engineering and pesticides (Carlsson et al., 2005). Lagerkvist et al. (2006) analysed Swedish consumers' attitudes to immunocastration (using biotechnology) as an alternative to surgical castration to investigate consumer trade-offs between animal welfare concerns (surgical castration), food safety risks related to the use of biotechnology, and food quality (specifically, taste, and the boar taint of non-castrated male animals). They found that animal welfare concerns were emphasized more than biotechnology aversion or food safety risk when the consumers were asked to compare immunocastration and surgical castration. However, the consumers placed higher value on pork from surgically castrated pigs than on pork from intact boars, which means that taste apparently dominates animal welfare concerns when it comes to the avoidance of boar taint. Essentially, respondents wished to maintain taste quality while improving pig welfare and avoiding the welfare problems caused by surgical castration. This shows just how complex the evaluation of

animal welfare attributes can become when the issue of castration is related to food safety, taste quality and animal welfare.

A common finding – indeed one made in most of the studies in this literature study – is that consumers seem to generally view animal welfare as a positive attribute; and among the product-oriented studies, a substantial proportion of consumers are found to believe that there is a link between high animal welfare production and meat quality. For instance, meat produced with animal-friendly husbandry practices is perceived by Swiss consumers as being of higher quality (in the study, no further specification of what is meant by quality is provided) than that reared intensively (Frewer et al., 2005). Ngapo et al. (2003) found that all respondents from focus group interviews in France, England, Sweden and Denmark were convinced that there is a direct effect of production on meat quality. Taste, tenderness, colour and freshness were mentioned as indicators of good meat quality. The factors believed to influence meat quality were feed, stress (on-farm handling, transport, slaughter and lack of space) and breed. English and French participants specifically believed that pigs that are reared extensively give better meat quality.

Consumer perceptions of four kinds of pork – "imported", "local-organically produced pork" "unbranded" and "branded" – are considered by Lind (2007). She aims to identify the consumers' motivations for buying specific kinds of pork and also clarify the attributes ascribed by consumers to the purchases. She found that the more differentiated products (branded and local-organically produced pork) had more complex motivational factors than the less differentiated ones, which indicated a higher consumer involvement. To the consumers purchasing "branded pork", quality was specifically associated with "good taste". To those buying "local-organically produced pork" it was associated with both "good taste" and "animal welfare". In comparison, consumers purchasing unbranded or imported pork did not consider quality, but they rated good taste together with low prices as the most important reasons to purchase. Mayfield et al. (2007) investigated consumer attitudes to, and behaviour affecting, animal welfare in Italy, Great Britain and Sweden. They found that consumers believed that good animal welfare would improve the taste of meat and improve human health (among other things). They concluded that animal welfare-friendly products are connected with a number of attributes in the minds of consumers, and thus are thought to introduce benefits that go beyond the mere utility of animals.

When animal welfare is associated with intrinsic characteristics (e.g. good taste, health, and safety) it can transform an intangible characteristic into an experience attribute, so that expectations can be confirmed after purchase (Nocella et al., 2010). It is important, however, to bear in mind that these findings about consumer attitudes are explored in studies framed within a certain paradigm (with the risk of placing words in their mouths): that is, there is a link between animal welfare and eating or sensory qualities, and as such the results really need to be considered further before any final conclusions are drawn.

Animal welfare and other societal issues

Focusing on Swedish consumers, Liljenstolpe (2011) investigated a range of animal welfare attributes in pork, including transportation time, castration, pen size, group size, outdoor access, mixing of unfamiliar pigs, bedding straw and number of pigs in the stable. In this study three consumer "segments" were identified with different attitudes to animal welfare. The finding was that 26% of the consumers surveyed belong to the most animal welfare-friendly segment, 55% to the moderately animal welfare-friendly segment, and 19% to the least animal welfare-friendly segment. Animal welfare had a positive meaning, in general, for the consumers studied, but it was found that the valuation of attributes may be heterogeneous and depends upon intrinsic preferences, or class membership.

The qualitative study by McEachern & Schröder (2002), conducted in Scotland, presents a discussion in which a differentiated view of quality is integrated. The authors define quality rather broadly as the degree to which a set of inherent characteristics fulfils a range of requirements. They investigate consumer value residing in meat consumption, with special emphasis on factors relating to organic production values. The meat involved is either pork or poultry, depending on what consumers have in mind. Their approach is to examine the factors determining choices in all meat purchases, and to evaluate how values were prioritized and integrated when choices were being made. They find that the criteria used to select fresh meat are primarily based on tangible aspects, such as price and eating quality (i.e. taste, fat level, and colour), rather than intangibles like animal welfare. Although the respondents were not selected for their commitment to organic meat purchase, most supported the values upon which organic production is founded and, among other values, a high level of animal welfare. This was evident particularly when aesthetic and safety issues were raised. However, the support for organic production was largely theoretical. It was not genuinely influencing meat purchases. In general, respondents cared about animal welfare, but there was a consensus that this was a matter for governments to deal with. Notably, some participants inaccurately assumed that intensive farming does not occur in Scotland, and that Scottish pigs are reared outdoors or free-range. The authors' hypothesis was that ethical meat consumption demands high levels of consumer awareness and an understanding of labels, and thus that information is very important. Their results confirmed that there is indeed a lack of information among consumers. It is noticeable that in studies of product quality characteristics, the contexts of valuation are rarely discussed. However, the findings of McEachern & Schröder (2002) and others (Lassen et al., 2006; Krystallis et al., 2012; Skarstad et al, 2007; Boogaard et al., 2011) indicate the importance of the context in which a given set of results are obtained.

Skarstad et al. (2007) argue that animal welfare, as a concept, has gradually morphed into a food attribute, and that the meanings of food may change as a result. In Norway animal welfare has often been regulated in ways that often go beyond EU standards. This means that welfare is an underlying "invisible attribute" of Norwegian products (p. 75). Skarstad et al. (2007) also provide an interesting discussion of potential problems that can be expected when animal welfare

becomes a more standardized, regulated and economically driven food quality attribute (Skarstad et al., 2007). This advance may tilt perceptions of farm animals towards the view that they – that is, the animals – are well-produced food commodities rather than well-treated farm animals (Skarstad et al., 2007).

Importantly, in some of the studies reviewed animal welfare describes, not a specific meat quality attribute, but the animal's quality of life (Boogaard et al., 2011; Boogaard et al., 2006; Te Velde et al., 2002). A few papers focus even more abstractly on animal welfare as a moral or ethical theme disregarding quality parameters and product attributes (Bennett & Blaney, 2002; Burgess & Hutchinson, 2005). One study concludes that the preferences for higher animal welfare products were related more to moral issues than to aspects of meat quality or sensory attributes (Vanhonacker et al., 2010). The same study integrates vegetarians in the empirical setting. It finds that vegetarians provide relatively homogeneous responses and attach a higher value to production methods and environmental impacts than do non-vegetarians. Harper & Makatouni (2002) conclude, in their study of British consumers, that buyers of organic food are more likely to be concerned about food-related ethical issues such as animal welfare, the impact of agriculture on the environment, and ethical trading, than non-buyers. Similarly, consumers who purchase free-range products are more likely to present ethical reasons to justify their motivations, e.g. concerns about the welfare of the animal for the animal's sake. This work positions purchases of animal welfare-enhanced foods on various levels – symbolic, social and literal. Izmirli & Phillips (2011) present a very broad comparative evaluation of European and Asian students' reasons for avoiding animal products, and the relationship between the consumption of animal products and attitudes to animals in Europe and Asia. One of the main reasons given by the students for their avoidance of animal products was increased concern about animal rights; more than 50% of them avoided some or all meat. Meuwissen et al. (2007) found that animal welfare, food safety and farm-related issues triggered explicit preferences for pork among Dutch consumers. They found that consumers are able to express their concerns about pork, and connected preferences, with reference to issues in pork production they can describe in detail.

A cross-study finding, primarily from the quantitative studies, is that public perceptions of animal welfare are positive when welfare is the only ethical issue listed among specific product-related attributes (e.g. price, taste, tenderness, flavour), but that when other societal and ethical issues are included, such as the environment, health, food safety, and farmers' conditions, animal welfare often scores relatively low. For instance, Prickett et al. (2010) found that animal welfare is a very important quality for respondents to their study in the US, and that the majority of respondents consider it to be more important than low prices. However, in comparison with other societal goals, they found that the financial well-being of US farmers is twice as important as animal welfare, and that food safety, the environment, health care, and poverty, are the most important issues. Likewise, US respondents in Lusk & Norwood (2008) ranked animal welfare lower than human poverty, the US health care system, food safety, the environment, the financial

well-being of US farmers, and food prices in general; and in Europe Petit & van der Werf (2003) and Vanhonacker et al. (2010) (among others) have discerned a similar pattern.

It is generally important, then, to pay attention to the attributes listed in a comparison before drawing any cross-study comparative conclusions. The low ranking of animal welfare among other environmental, ethical and societal attributes cannot always be translated safely into lack of interest in buying welfare-friendly products. In a purchasing situation animal welfare is assumed to be easier to opt for than attributes like "the financial well-being of farmers", "human poverty" and "the US health system".

Importantly, regardless of the sometimes mixed findings on the ranking of animal welfare issues relative to other product-related and/or broader ethical priorities, many studies point to the existence of a market segment that *specifically* values animal welfare, and considers it explicitly when choosing animal-based food products (Vanhonacker et al., 2010; Vanhonacker et al., 2007; Cerjak et al., 2011; Verbeke et al., 2010; Krystallis et al., 2012; Krystallis et al., 2009; Tonsor et al., 2009a; Nocella et al., 2009).

Willingness to pay (WTP)

It is likely, of course, that consumers' evaluations of animal welfare as a quality attribute will influence their motivation to buy welfare-enhanced products and possibly result in a raised WTP in relation to such products. WTP here could be driven either by a perception that animal welfare has a positive effect on other quality attributes, or a positive evaluation of animal welfare per se, or even, perhaps, other factors. Many studies in the literature reviewed here examine the relationship between attitudes, motivations and behaviour.

Consumer WTP refers to the maximum amount of money an individual would, hypothetically, be willing to pay in exchange for a good or to avoid something undesired. It is important to note that such measurements may not be representative of the real behaviour of consumers because more sensory product-related characteristics also influence purchasing behaviour (Napolitano et al., 2010). Investigating this divergence, Vanhonacker et al. (2007) discuss the observed differences between what people say and what they actually do. In the course of their discussion they invoke the "consumer-citizen" gap or duality:

> Individuals tend to respond to questionnaires as citizens and in this role, they claim to pay more attention to animal welfare. However, when they make a choice in the outlet as a consumer, they turn out not to be equally willing to pay for more animal-friendly products (p. 86).

Replies to the ethical questions asked in questionnaire or interview surveys tend to be sensitive to the respondent's sense of what it would be socially acceptable to say – a tendency known as

acquiescent responding or the "yeah-saying bias" (Krystallis et al., 2009; Vanhonacker et al., 2007). Many analyses of this gap between intentions/attitudes/values and performance/behaviour/action have been proposed, and in-depth discussion of them would go beyond the scope of this paper. For further reading on this topic, specifically in relation to animal welfare, see Lagerkvist et al., 2006; McEachern & Schröder, 2002; Verbeke, 2009; Verbeke et al., 2010; Krystallis et al., 2009; and Vanhonacker, 2008.

WTP findings are highly context dependent, just like any other statement or behaviour. Therefore, it is important to be careful when extrapolating from stated consumer WTP for animal welfare attributes to conclusions about actual food purchasing decisions. For instance, a thorough exploration of the respondents' preferences, attitudes, values, thoughts, expectations, and experiences, is advisable; and it may be necessary to consider whether purchasing behaviour, or support for legislative initiatives to improve animal welfare, are the aim of the analysis.

There are numerous WTP studies of non-market values, and increasingly animal welfare, as a value, is being investigated. Only a few of these studies satisfied the search criteria. Many were excluded because animal welfare was examined in connection with farm animals other than pigs. The following summary will emphasize some of the relevant findings and sum up some of the main tendencies.

First and foremost, it is certainly possible to detect a general willingness to pay a price premium for enhanced animal welfare – formulated as animal welfare in general, or as animal welfare related to the production of pork.

WTP for animal welfare and information

In an Australian study by Taylor & Signal (2009) 34% of respondents stated that they would be willing to pay 5–10% more for animal-based products from animals afforded the "five freedoms" (type of animal not specified) (p. 351). Women showed higher WTP than men, personal and household income levels had a significant and positive effect on WTP, and age was inversely related to WTP (i.e. WTP decreased as age increased). The majority rated their level of knowledge of production practices as either none or limited. However, higher levels of knowledge were associated with higher WTP (p. 353). The majority of respondents indicated that they were concerned about general welfare issues, and reported levels of concern had a significant effect on WTP (p. 354). Taylor and Signal (2009) recommend that future research should examine species-specific knowledge of production processes and investigate potential links between knowledge and WTP (p. 357).

Mayfield et al. (2007) investigated attitudes to the obligation to pay for animal welfare. They found a general willingness among consumers in Italy, Great Britain and Sweden to pay a premium price to ensure improved animal welfare standards. At the same time, many consumers did not

think about animal welfare when going food shopping and did not like to think that meat comes from a live animal (p. 71). The authors note that their finding is consistent with the theory of cognitive dissonance. In addition, a substantial proportion of consumers stated that they tried to buy welfare-friendly food products. However, many found sourcing such products difficult and felt they lacked appropriate information. In particular, product labels were cited as the prime source of information that the respondents thought they might use (91–96% of respondents) followed by in-store information (around 84–89%), mass-media (69–75%) and the internet (32–42%).

Investigating undergraduate students in the UK, Tawse (2010) found that a higher level of awareness of pork production methods and a previous visit to a conventional pig farm were associated with greater concern about pig welfare. Tawse (2010) linked this concern with increased WTP a premium for welfare-friendly pork. (p. 163).

WTP for animal welfare in pork and pigs

Mørkbak et al. (2010) investigated Danish consumers' preferences against a range of minced pork attributes. The animal welfare attribute was formulated as the pigs having outdoor access, larger amounts of hay than conventional pigs, and more space. They found the following ranking of attributes, in decreasing order: low fat, domestic produce, Salmonella free, animal welfare and reduced risk of antimicrobial agents. Mørkbak et al. (2010) derived identical rankings using WTP estimates in a choice experiment in which they allowed respondents to rank attributes directly.

Dransfield et al. (2004) investigated potential links between pig production systems (indoor versus outdoor) and other pork product qualities. Specifically, they studied the relationship between appearance, eating quality and the price that consumers are willing to pay for pork labelled with information concerning indoor versus outdoor production systems and origin of pig production in four European countries (Denmark, Sweden, Great Britain, France) (p. 62). In all four countries studied, the labels influenced preferences for the fresh pork, and in Britain and France they also increased the perceived eating quality of the cooked pork. Origin was found to be more consistently chosen than outdoor production when pork was chosen on the basis its appearance; it was equally important in appreciations of eating quality.

WTP for pork from gestation crate free productions

Tonsor et al. (2009a) investigated the attributes "place of origin" and "animal welfare" in pork. They found that respondents from Michigan, in the US, showed a significant preference for pork from Canada over pork from the US, with a WTP of $1.44/lb. The same respondents had a positive preference for pork voluntarily produced without use of gestation crates, with a WTP of $2.11/lb. (p. 723).

In a follow-up analysis, Tonsor et al. (2009c) investigated Michigan citizens' WTP for three pork attributes: farm size (small, medium, large), place of origin (Canada, the US, Brazil) and production practice (typical, labelled gestation crate free, mandatory gestation crate free). The results showed that the average consumer has a negative WTP for large farm products, as compared with medium or small farm products; Canadian pork is preferred over American pork, which is preferred over Brazilian pork; pork labelled gestation free is strongly preferred over pork from a typical practice and pork produced under a gestation crate ban.

However, it is noteworthy that a latent class categorization into four consumer groups identified large differences between the groups denoted by the pork enjoyers attribute-conscious, price-conscious and ban preferring. Tonsor et al. (2009c) also tested the effects of information and found no differences in WTP in relation to information on gestation crates provided by three sources: the industry (almost positive and fact-loaded), consumer groups (sceptical in tone) and base (a neutral description).

Uzea et al. (2011) found that the average Canadian consumer states a positive and significant WTP for outdoor reared sows and sows raised indoors in groups rather than conventional housing and gestation stalls (p. 297). Using a latent class model they found significant differences between animal welfare activist consumers and four other consumer groups in respect of price sensitivity, choice of certifying agent and preferences for animal welfare.

Norwood & Lusk (2011) used a combination of auctioning and conjoint methods in order to improve the consistency of elicited preferences. They investigated preferences in connection with a range of animal welfare attributes borne by pork and egg products (price, space, nesting, survival rate, surgeries, free range, group size, and feed: for more details, see p. 82). Their results indicate that moving to a free-range system is highly valued, but only when it is accompanied by shelter and pasture. They also conclude that although pasture systems can result in lower survival rates for baby pigs, the disutility of this decline in survival rate is more than offset by the extra utility gained through the move to pasture (p. 92).

A number of studies have investigated WTP for mandatory labelling of pork, as compared with WTP for the imposition of regulatory minimum standard.

Using contingent valuation, Tonsor & Wolf (2011) found general support among US citizens for mandatory labelling of pork from gestation free production systems, although the support was somewhat lower when price increases were introduced (falling from around 62% of the respondents supporting the mandatory labelling to approximately 18%)(p. 432). Using contingent valuation techniques they estimated the average consumer would be WTP about 20% higher for pork and egg in the evaluated mandatory labelling schemes (p. 435). Information affected support for mandatory labelling: sceptical information from consumer groups about gestation stalls increased support for mandatory labelling, and less sceptical information from the industry reduced that support.

The authors provide a list of issues to be considered in future discussions of mandatory labelling. These include: thorough cost-benefit assessment should be undertaken; voluntary labelling schemes should also be considered; mandatory labelling may not enhance consumer choice if relocation of production is the consequence; food label information overload must be considered; disconnects between frequent meat consumers and advocates of production practice bans must be delineated; there may be potential value in developing a composite animal welfare index.

Using choice experiments, Olynk et al. (2010) investigated US citizens' WTP for four animal welfare-related attributes of dairy and pork products: individual crates/stalls, pasture access, antibiotic use, certified trucking/transport (p. 263–264). They also analysed the importance of who provided information, and they found that USDA-certified attributes were associated with higher WTP than verifications provided by a private third-party group, a consumer group, or the producer in self-verification.

A comparison of Tonsor et al. (2009c) and Olynk et al. (2010) highlights the importance of the context in which results are obtained. Tonsor et al. (2009c) would conclude that there were no differences between the effects of the three types of information investigated, while Olynk et al. (2009c) would conclude that choice of verifying party might indeed matter.

Table: Overview of articles relating to WTP for gestation crate free sows

Title	Authors	Special comments
Willingness to pay: Australian consumers and "on the farm" welfare.	Taylor & Signal (2009)	General WTP for FAW* – low level of knowledge (Australia)
Consumption of welfare-friendly food products in Great Britain, Italy and Sweden, and how it may be influenced by consumer attitudes and behaviour relating to animal welfare attributes	Mayfield et al. (2007)	General WTP for FAW – many do not want to think of animal when shopping for meat. Lack information on FAW (Italy, GB, Sweden)
Consumer attitudes to farm animals and their welfare: a pig production case study	Tawse (2010)	Visit to farms increase WTP
Consumer preferences for farm animal welfare : results from a telephone survey of US households	Prickett et al. (2010),	Low prices must not be at the expense of low FAW. Differences in perception of FAW (US)
Consumer preferences for safety characteristics in pork	Mørkbak et al. (2010)	Lower WTP for outdoor pig production than low fat, domestic produce, Salmonella free (Denmark)
Consumer choice and suggested price for pork as influenced by its appearance, taste and information concerning country of origin and organic production	Dransfield et al. (2004)	Labels of outdoor production or domestic produce increase WTP for fresh pork and perception of eating quality. (Denmark, Sweden, France and GB).
Activists and Animal Welfare: Quality Verifications in the Canadian Pork Sector	Uzea et al. (2011)	Average consumers are WTP for outdoor housing of sows and for sows in groups vs. gestation stalls. Large heterogeneity in population. (Canada)
A CACM: Valuing pork and eggs produced under differing animal welfare conditions	Norwood & Lusk (2011)	A range of FAW attributes of pork and egg. Free-range only highly valued when accompanied with shelter and pasture. (US)
On mandatory labelling of animal welfare attributes	Tonsor & Wolf (2011)	Support for mandatory labelling of pork from gestation free production systems – lower support when price increase follows. Average consumer WTP about 20% higher pork and egg prices for mandatory labelling.
Consumer willingness to pay for livestock credence attribute claim verification	Olynk et al. (2010)	4 FAW attributes analysed: Individual crates/stalls, pasture access, antibiotic use, certified transport. USDA-certified attributes associated with larger WTPs than for private third-party group, a consumer group, or producer. (US)
Consumer Preferences for Animal Welfare Attributes: The Case of Gestation Crates.	Tonsor et al. (2009c)	Negative WTP for large farm vs. medium/small farm products, WTP for Canadian pork > WTP for American pork > WTP for Brazilian pork, WTP for label gestation free > WTP for typical practice and gestation crate ban. Large preference heterogeneity between pork enjoyers attribute-conscious, price-conscious and ban preferring consumers. (Michigan)

*** FAW= farm animal welfare**

Cross-national studies

Information and trust

There seems to be significant variation in consumer attitudes among countries, and contrasting explanations of the formation of consumer attitudes have been proposed. Potential reasons for the variation include: differences in legislation and regulation (Tonsor et al., 2009b), local farming situations (Martelli, 2009), consumers' knowledge of animal rearing conditions and systems (Vanhonacker et al., 2007; Knight et al., 2003; Toma et al., 2011; Taylor & Signal, 2009; McEachern & Schröder, 2002), socio-political issues (Phillips et al., 2012; Boogaard et al., 2011; Knight et al., 2003; Ngapo et al., 2003), and the trustworthiness of marketing information systems (Nocella et al., 2010).

Consumer trust, and attitudes to information and labelling, both seem to be important questions in the cross-national studies reviewed in this literature study. For instance, in their discussion of consumer trust in farmers ensuring an acceptable level of animal welfare, Nocella et al. (2010) found that trust differed between northern and southern Europe, despite the countries surveyed belonging to a well-defined economic area (Britain, France, Germany, Italy, and Spain). Respondents from northern European countries (Britain, France and Germany) trusted farmers to secure freedom of movement for the animals, to guarantee that animals kept in stables are inspected at least once a day, and to feed animals a balanced diet. Only consumers in Britain, France and Germany stated that they were willing to pay a premium price for certified animal-friendly products. Hence, consumer WTP appears to be positively affected by trust in farmers – and in this respect cross-cultural differences exist. According to Nocella et al. (2010), a possible reason for the differences between countries is that the marketing information systems in northern Europe are more trustworthy than those in southern European countries.

Mayfield et al. (2007) conducted a cross-national consumer survey to discuss the issue of animal welfare as a credence attribute together with information and trust. They found that nearly all respondents in Italy, Sweden and Great Britain are concerned about animal welfare, but that slightly more than half of them do not feel as well informed about animal welfare issues as they would wish to be. (Marginally more respondents disagreed with the statement that they feel sufficiently informed than those agreeing.) At the same time, when eating meat, most respondents in all of the countries were reluctant to think of it coming from a live animal. Nor did they think of animal welfare when purchasing meat. This example can be analysed by applying the theory of cognitive dissonance and its effect on consumer utility to meat purchases and concerns about animal welfare.

The only cross-national study using focus group interviews in this literature overview was conducted by Ngapo et al. (2003). The purpose of the study was to gain insight into pork purchasing decisions, and into attitudes to pig production systems, in France, England, Sweden

and Denmark. The general conclusion involving respondents from all countries is in line with Mayfield et al. (2007) inasmuch as it confirms cognitive dissonance based on consumer confusion and lack of trust in the information supplied in the purchasing situation. The English participants (in particular, urban women) specifically adopted an "ignorance is bliss" attitude, preferring not to know about the production processes while prioritizing taste over concern about rearing conditions.

Taking the notion of cognitive dissonance as a starting point, Toma et al. (2011) analysed the impact of attitudes to animal welfare on consumers' stated willingness to change their usual place of shopping (behavioural willingness) in order to buy more animal welfare-friendly food products. The data were extracted from the Dataset Eurobarometer 66.1 (EC, 2006) and were based on face-to-face interviews. Results from nine European countries (Great Britain, Finland, Ireland, Lithuania, Malta, The Netherlands, Poland, Portugal, and Spain) were compared, with special attention to labelling and information as a means to improve the WTP for animal welfare enhanced products. The authors found that access to information about the conditions under which animals were farmed had a significant and positive impact on behavioural willingness in all countries, implying (they argued) that better consumer access to information fosters a stronger sense of responsibility, more awareness of labelling, and greater behavioural willingness to change shopping venue. Perceived responsibility of consumers for animal welfare significantly impacts upon behavioural willingness in a positive relationship – that is, the stronger the perceived responsibility the stronger the behavioural willingness (Toma et al., 2011).

Attitudes and socio-demographic variables

Some of the studies reviewed here focused on differences in socio-demographic variables in different countries as a factor that might influence consumer attitudes to animal welfare. Drawing on quantitative surveys, Krystallis et al. (2009) compare Belgian, Danish, Polish, and German consumer attitudes to pig production and discuss the degree to which these attitudes are influenced by economic, social and environmental attributes. The overall results they present indicate that consumers in Denmark and Germany are more strongly in favour of socially responsible types of pig farming (small sized, local, animal-conscious, beneficial for consumers in terms of healthiness and quality) than consumers in Belgium and Poland. In more detail, Krystallis et al. (2009) identify four clusters of respondents in the countries in which they are interested:

- Cluster 1 (17%): Environment-conscious respondents who support medium-scale and large-scale pig farming. They came from all countries, but especially from Poland and Germany. In terms of its socio-demographic profile, cluster 1 constituted of a type of European "elite", since it was somewhat "better educated" and well off. This cluster displayed a rather pessimistic view of the pork industry's efforts to reduce harmful impacts on the

environment and nature. It also held a strong belief in the need for environment-friendly food production.

- Cluster 2 (59%): Indifferent and average citizens represented mostly by respondents from Belgium and Poland. This cluster held the least strong attitudes to the environment and nature, animal welfare, and the need for an environment-friendly food production. It also had the highest percentage of regular pork eaters.
- Cluster 3 (12%): Animal welfare-conscious citizens represented especially by respondents from Germany and Denmark. This cluster was less urban than the other three, contained more women than the sample average, and had the smallest percentage of highly educated people and the lowest percentage of reasonable income earners. They held the second strongest attitude to animal welfare and favoured certain features of large-scale pig farming.
- Cluster 4 (11%): Small-farm supporting citizens, principally from Denmark and Germany. This cluster was less urban than cluster 1 and cluster 2. It contained the largest percentage of women, an average percentage of highly educated people, the highest percentage of salaried employees, and the second lowest percentage of well-off consumers. These respondents held the strongest (most pessimistic) attitude to the environment and nature, the strongest attitude to animal welfare, and the second strongest attitude to the need for environment-friendly food production (Krystallis et al., 2009).

Krystallis et al. (2012) supplement the empirical setting adopted in Krystallis et al. (2009) with quantitative surveys in Brazil and China in order to map the attitudes of consumers in three continents. Their purpose is to examine attitudes to characteristics of pig production and whether these attitudes are connected with general attitudes to (environmental and social) sustainability and demand for specific pork products. Across the three continents, consumers' attitudes to the environment and nature, animal welfare, and industrial food production turned out to be, on average, rather/moderately strong. Respondents from the European countries and Brazil assign the greatest importance to animal welfare and environmental concerns as criteria with which to discriminate between "good" and "bad" pig farming practices. The clusters of consumers identified in Krystallis et al. (2009) are also found in this study in the European countries and Brazil: the environment-conscious, main cluster covering the bulk of indifferent average citizens (specifically Brazilians) and animal welfare-conscious respondents who support small-scale, extensive pig farming.

In China three other clusters of consumers were identified: Cluster 1 (44%) respondents displayed indifference to almost all examined factors and had the weakest attitudes to all sustainability attributes. Cluster 2 (32%) was identified as food safety-conscious citizens who put, almost to the point of exclusivity, the strongest emphasis on the maximization of food safety efforts. They also expressed the strongest concern about the environment and the most positive attitude to technological progress. Cluster 3 (23%) preferred industrial pig production characteristics such as large farm size. Krystallis et al. (2012) interpret the three clusters of Chinese respondents as three

stages in a diffusion process: stage 1 consists of a social group without concerns about social sustainability issues; stage 2 consists of a social group that has become concerned about the way pork is produced as the result of a food safety issue; and stage 3 consists of a social group that perceives large-scale industrial production as a solution to food safety issues. Sustainability attitudes therefore relate to citizens' attitudes to pig production, and respondents with stronger attitudes to eco-friendly and social-friendly food production also tend to belong to clusters with stronger opinions about pig production systems, and vice versa (Krystallis et al., 2012).

Phillips et al. (2012) examined citizens' attitudes to the welfare and rights of animals in European and Asian countries with the aim of deepening our understanding of cultural differences that might impact upon trade and international relations. In a quantitative survey targeting 103 universities in Europe and Asia, students were asked to rate the acceptability of 43 possible concerns about animal use, to rate the importance of 13 world issues, and to rank different species in relation to sentience. The results were compared with Eurobarometer data (EC, 2005a; 2007a) and this comparison showed some divergence (no attention is paid to the different designs of questionnaires). For instance, the perceived sentience of chickens was almost the lowest of all animal species included in the study conducted by Phillips et al. (2012), whereas in the Eurobarometer data the conditions for laying hens were judged to be worse than conditions for pigs and dairy cows, and both laying hens and broilers were the species that respondents felt needed most welfare improvement. The latter finding is similar to those in Mayfield et al. (2007), where consumers from Italy, Great Britain and Sweden considered the welfare conditions of hens to be poorer than those of dairy cows and pigs. Swedish consumers were the least negative about welfare conditions for hens, and British consumers were the most negative. These results were reversed for pigs: here British consumers were more positive about pig welfare than consumers in Italy and Sweden.

In Mayfield et al. (2007) these results are viewed as a possible indication that animal protection campaigners have affected consumer attitudes to battery hens and broilers – and that the sight of pigs being raised outdoors has had positive influence.

In another conflict with the results of Eurobarometer, Phillips et al. (2012) failed to confirm that Swedish respondents have a strong attitude to animal welfare and animal rights. Importantly, the authors point to both differences in the number of topics considered in the surveys and the relatively strong animal welfare legislation in Sweden. That is, they suggest Swedish respondents may find more issues acceptable because they are reasonably confident that animal welfare is being adequately protected.

The overall conclusion to be drawn from the empirical findings made by Phillips et al. (2012) is that students in European countries are more concerned about animal welfare than students in Asian countries. Southern and central European countries showed the highest levels of concern about animal rights and "unnatural practices", and particularly strong support for animal welfare was

found in eastern Mediterranean countries. The latter was found in Eurobarometer as well (EC, 2007a), which also showed strong concern about animal welfare in Scandinavian countries. When they looked at socio-political perspectives, Phillips et al. (2012) found that students in communist, or former communist, countries in Asia and Europe had the highest levels of concern about killing animals, and that those in northern European countries had the lowest. Regional similarities between neighbouring countries were evident in responses to animal issues, and no differences between ethnic groups within a country were found. Thus, there were national and continental differences in European and Asian students' attitudes to animal welfare and animal rights, and these differences appeared to arise as a result of the socio-political situation in regions rather than religious or other differences (Phillips et al., 2012).

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