



Effect of tasting and information on consumer opinion about pig castration



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ABSTRACT

Our research explored the relative importance of pig castration amongst other aspects of animal welfare, and the potential impact of information and sensory experiences on European Union (EU) consumers' preferences. The EU is considering a future ban on surgical pig castration by 2018 which may affect markets and consumers' preferences. We carried out an empirical study using consumer-level data obtained from questionnaires completed in a controlled environment by a total of 825 consumers. The experiment was carried out in six EU countries (Spain, United Kingdom, The Netherlands, France, Italy and Germany) which account for 66.0% of the EU-27's and 76.3% of the EU-15's meat production. Results show that consumers do not perceive pig castration to be a relevant aspect of animal welfare nor its relationship with meat quality. Consumers with healthy life styles, concerned about animal welfare and who have had a negative sensory experience with boar meat are willing to accept paying more to avoid boar taint.

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1. Introduction

Animal welfare has become a relevant factor affecting consumer preferences for food products. Consumers are demanding animals being reared, fed and housed as closely as possible as they would in their natural conditions and animals being slaughtered in a quick and painless way (Harper & Henson, 2001). European consumers are concerned about animal welfare and are generally uninformed and unfamiliar with farm production systems (EC, 2005, 2007). They would prefer to have more information to guide them in making decisions about food.

Within the EU, the growing concerns about animal welfare are being extensively debated, resulting in continuous changes in regulations and policies. Animal welfare is becoming a prominent and politically sensitive question that has received attention from the EU authorities. The starting point was the Protocol on Animal Welfare (EC, 1997), which stated the need to “ensure improved protection and respect for the welfare of animals as sentient beings”. In the following years, the EU has attempted to integrate public preferences into its agricultural legislative framework. Within its agenda, regulations have led to bans of a number of intensive farming methods.

In this context, pig welfare has received and is still receiving special attention as pork is the most produced and consumed meat in the EU (FAOSTAT, 2010). Council Directive 2008/120/EC, the latest update to Council Directive 91/630/EEC on pig welfare, has banned

the use of sow stalls by January 2012, and the EU is considering a future ban on surgical pig castration by 2018. The latter aspect has become increasingly controversial as social concern for animal welfare in Europe has increased.

The castration of entire male pigs is regulated by Commission Directive 2001/93/EC, which declares that it can only be performed using methods that do not involve tearing of the tissue. Castration performed seven days or later birth should only be performed under anaesthesia and must include the administration of prolonged analgesia by a veterinarian. Although castration can be legally performed without anaesthetics during the first seven days after birth, there is evidence that suggests that castration at any age is painful (SPAHW, 2004; Taylor, Weary, Lessard, & Braithwaite, 2001).

As it is well known, the castration of male piglets is an important step in obtaining high quality meat that satisfies consumer preferences. It improves the sensory attributes of fresh pork meat by increasing fat content (and intramuscular fat content) and by avoiding boar taint, which is a distinctive and unpleasant taint perceived through a combination of odour, flavour and taste in pork and pork products from entire male pigs. Castration may also have benefits in terms of management and behaviour. Castrated male pigs are less likely to fight and have reduced aggressive and sexual behaviours, helping to minimise injuries and stress. On the other hand, a non-castration policy would lead to a higher percentage of lean meat (2.5–3.0%), better feed conversion (0.2–0.4), lower production of manure (10%), lower incidences of disease, reduced veterinary labour and improved animal welfare (Bonneau, 1998; Lundström, Matthews, & Hauge, 2009; Walstra, 1974).

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The implementation of the EU pig welfare directives is also affecting pork markets. The results from some studies (Van Duijn & Schneider, 2010) have shown that the costs of pig production have tended to increase as a result of the adoption of the new animal welfare standards. Data show that the number of farms and slaughterhouses has decreased in the past decades, while their sizes have increased (Carlsson, Frykblom, & Lagerkvist, 2007). Nevertheless, this trend of large agri-business scale cannot be only attributed to changes in regulation because other determining factors are important as well. Economic factors could be one of the most significant features that may determine the likelihood of meat producers to exit the market (Kallas & Lambarara, 2010).

Despite the impact of pig welfare regulations on production costs, more favourable valuations from consumers would allow slight increases in the price of animal-friendly products, which could compensate producers. In this context, public intervention was not far from private sector reactions. Several attempts have been made to promote “animal-friendly” products. The *Freedom Food* private initiative is a food-labelling action that focuses on improving the standard welfare of English farm animals by attempting to ensure the animal welfare of its products. Similarly, in the United States, some speciality grocers are selling *animal-compassionate* meat that prioritises the well-being of animals. There are even certification agencies and labels, such as *certified humane*, that are available to producers interested in these niche markets (Norwood & Lusk, 2008).

According to Fredriksen et al. (2009), about 97.6 million pigs (79.3% of the total EU pig production) were castrated in 2008 in the EU, 48.7% of which were surgically castrated without anaesthesia. Castration is barely practised in Ireland or the United Kingdom, where animals are slaughtered at lower weights. In Portugal, Spain and Cyprus, the practice is limited. Meat from these pigs is mainly reserved for the production of high quality fresh and processed meat products. In the remaining EU countries, the practice of castration is heterogeneous, ranging from 75.6% in Greece to 100% in the Czech Republic. Norway and Switzerland stopped the castration of pigs in 2009, and most Dutch pork has been obtained from animals that were castrated under anaesthesia since 2009 (Spooler & Baltussen, 2008). Many countries have continued to refuse boar meat; for this reason, the pig industry considers the castration of male piglets to still be necessary.

A key question may arise: what occurs if improving animal welfare would negatively impact the quality of meat? The answer to this question is not straightforward because consumer decisions are complex and multi-dimensional. Some useful insights are available from both sides. First, it is well known that consumers are willing to pay an extra price to ensure animal welfare (Bennett & Blaney, 2002; Bennett & Larson, 1996; Gracia, Loureiro, & Nayga, 2011; Napolitano, Girolami, & Braghieri, 2010; Nocella, Hubbard, & Scarpa, 2011 amongst others), but on the other hand, the sensory experience during consumption is a critical aspect influencing consumer acceptance of the product (Agerhem & Tornberg, 1993).

In this context, the main objective of this study is to gain insight on the relative importance of pig castration amongst the other aspects of animal welfare in six EU countries (Spain, United Kingdom, The Netherlands, France, Italy and Germany). We also seek to analyse the potential impact of information and sensory experience on consumer purchasing behaviour and willingness to pay for the guaranteed sensory quality of meat obtained from non-castrated pigs.

2. Material and methods

2.1. Methodological framework

Our methodological framework consisted of three main stages: a pre-questionnaire, a sensory and kitchen test and, finally, a post-questionnaire.

Pre-questionnaire: The first part of the questionnaire was mainly focussed on analysing the preferences and attitudes of consumers

towards pork consumption (C), their opinions about pig welfare regulations (R), the welfare aspects of pig production (O) and the relative importance of meat attributes (W) when purchasing pork. Finally, in this step, the socio-demographic (S) and psychographic characteristics (life styles) (P) of respondents were collected. Most of the variables were measured using a 9-point Likert scale.

For the variables that assess the aspects of pig welfare (O), the Principal Component Analysis (PCA) was used as a mathematical procedure that seeks to convert a set of correlated variables into a set of values of linearly uncorrelated variables called principal components. In addition, the Analytical Hierarchy Process (AHP) was used as a multi-criteria decision-making methodology to estimate the weights of pork meat attributes (W) in consumer purchasing decisions.

Sensory and kitchen test: In a second step, eating acceptability (E) and kitchen tests (K) were carried out. In this phase, consumer experiences with boar meat were analysed. Consumers were asked to taste three types of meat: a) pork meat with boar taint obtained from an entire male (non-castrated) pig with androstenone over 0.5 ppm and skatole over 0.1 ppm (hereafter known as detection +), b) pork meat without boar taint obtained from an entire male pig with low levels of androstenone (>0.5 ppm) and skatole (<0.1 ppm) (hereafter known as detection -) and c) pork meat obtained from a gilt (control meat). Consumer acceptability was assessed in terms of taste and odour. After this sensory test, a kitchen session was also realised. During this test, a piece of boar pig meat (detection +) was cooked in the presence of consumers and their acceptability was assessed in terms of odour. Both experiments (sensory and kitchen), used a 9-point Likert scale. At the end of this step, consumers received information about the type of meat that they had tasted and smelled. Specifically, they were informed about the relationship between pig castration and meat quality in terms of odour, highlighting information about boar meat. The information was based on three ideas: a) You have eaten pork meat from gilts and non-castrated pigs, b) non-castrated pigs may or may not have an odour that could be unpleasant or not for some people and c) people perceive the odour differently due to their genetics. Thus, some people can perceive it and others cannot.

Post-questionnaire: In the third phase, the potential impact of information (I) and sensory experience (E) on consumer opinions about pig castration was analysed by repeating the related questions from the first questionnaire. Finally, in this step, the willingness to pay (WTP) to ensure the sensory quality (taste and odour) of the fresh pork meat obtained from non-castrated pigs was assessed using the Contingent Valuation (CV) method. The CV is a monetary valuation method based on simulating real market responses in order to analyse the stated preference of consumers. The Heterogeneity (H) of the WTP was subsequently analysed through a two-limited Tobit model, using the results and variables obtained from the previous steps. A summary of all the steps of our methodological framework can be seen in Fig. 1.

Data used in this analysis was obtained from questionnaires completed in a controlled environment by consumers from six EU countries (Spain, United Kingdom, The Netherlands, France, Italy and Germany). These selected countries represent 76.3% of meat production and 72.5% of the slaughtered pig head within the total EU-15 and, 66.0% and 61.8% within the EU-27 respectively. As mentioned above, the survey collected extensive information on the socio-economic backgrounds of the consumers along with their attitudes, preferences and opinions regarding pig welfare. A quota sampling procedure was used to guarantee a representative sample in terms of age and gender, taking into account the population distribution of each country. A total of 825 consumers were surveyed (Table 1).

2.2. The relative importance of pig gender when purchasing pork

To analyse the relative importance of the attributes and levels, specifically of pig castration, to consumer decisions, the AHP was applied. The AHP is a multicriteria decision-supporting method (Saaty,

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