KOREAN CONSUMER ACCEPTANCE OF IMPROVAC AND THE IMMUNIZATION APPROACH

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Abstract— **The use of Improvac®, a novel immunological product to control boar taint, is highly dependent upon consumer attitudes towards vaccination to control boar taint. To assist in understanding this issue, a survey was administered online to 1,000 Korean pork consumers responsible for purchasing meat for their households. Participating consumers rated the immunization approach to controlling boar taint as acceptable significantly more often than the alternative, physical castration (59% and 25% respectively). Additionally, when asked about their preference for either method, 62% of consumers preferred the vaccination approach with another 21% being neutral. By comparison only 17% preferred the physical castration method. The overwhelming majority of participants in these surveys found immunization to control boar taint to be acceptable compared with physical castration, as long as there was equivalent taste quality, results that are inline with similar consumer acceptance surveys from several other countries.**

Index Terms— **Boar Taint, Consumer Acceptance, GnRF, Improvac, Immunization, Physical Castration.**

I. INTRODUCTION

Global population growth and greater demand for pig meat will continue to place pressure on the world's pork supply. Therefore, to meet this demand the industry must become more efficient. One way to increase production efficiency is to raise boars rather than castrates (Dunshea et al., 2001). However, pork from some boars can have an offensive smell and taste, known as 'boar taint'. Thus, most of the world's male pigs are physically castrated early in life. However, there are problems with castration that make this choice undesirable. Compared to boars, castrates are less feed efficient, often grow slower, are less lean, and produce more effluent. There are also growing animal welfare concerns with physical castration (EFSA, 2004). If society is to continue raising animals for food we must become more energy efficient, produce less effluent and continue to improve animal welfare.

Improvac®, a novel immunological product to control boar taint, gives pig producers a powerful new tool to address these challenges. By providing an alternative to physical castration, Improvac allows producers to benefit from the natural growth and carcass quality advantages associated with non-castrated male pigs while controlling boar taint. However, before the use of Improvac can become common practice it must be shown to be acceptable to consumers. At one level this means proving that use of the product can reliably produce pork of high eating quality. Multiple sensory studies in a range of countries have been reported and clearly demonstrate that pork from boars given Improvac is of equivalent sensory quality (odor, flavor, juiciness, tenderness and overall acceptability) to pork from female or physically castrated male pigs, and superior to pork produced from lightweight entire male pigs (standard practice in a few countries) (Hennessy and Newbold, 2004; Singayan-Fajardo et al., 2006; Jeong et al., 2006a & b; Boghossian et al., 1995; Lodge et al., 2008).

Consumer acceptance, however, also involves factors beyond meat quality. Consumer concerns about food safety, animal welfare, and the ethical and environmental impact of modern farming practices, also influence their attitude to the introduction of new technologies in food production.

Improvac has recently been approved for use in Korea as well as several other Asian countries and in preparation for market release a survey of Korean consumers was conducted for Pfizer in early 2008 by a commercial market research company (DMR Kynetec).This paper will review the findings from this survey and provide evidence that demonstrates that the control of boar taint through the use of an immunological approach, such as Improvac, is acceptable to consumers in Korea. Indeed the evidence clearly shows that the majority of consumers, when faced with a choice between physical castration and immunization, prefer the immunological method of boar taint control.

II. MATERIALS AND METHODS

The survey was designed to understand and quantify the Korean consumer's attitude towards vaccination to control boar taint as an alternative to castration. A total of 1,000 Koreans, who were responsible for the purchase and preparation of meat in their households, were surveyed using an online questionnaire. The consumers were all regular pork consumers and were not associated with pig production or the animal health industry. The participant gender ratio was 70% female and 30% male; the average age across the group was 40.7 years. The consumers were provided with a short description of the methods, as well as the positive and negative aspects, of the two alternatives for the control of boar taint – immunization (referred to as vaccination in the survey, hence the use of the term vaccine in some of the figures below) and physical castration. The methods were introduced in a randomized order across the 1,000 participants. The former description included an explanation that the product worked by temporarily limiting the functioning of the testes. Additionally, a description of boar taint was provided to ensure that consumers understood the driver behind the use of either option. After considering the information the consumers were asked about the acceptability of each method of taint control. Consumers were asked to rate questions on a 7-point scale, where a rating of 1 was the most unfavourable rating ('completely unacceptable'), a rating of 4 was a neutral response, and 7 was the most favourable rating ('completely acceptable'). Participants were also questioned on their preference between the two alternatives using a similar scale where strong preference for physical castration and strong preference for the vaccine method were placed at opposite ends of a 7- point scale and a rating of 4 was a neutral response.

III. RESULTS AND DISCUSSION

When asked about the acceptability of each method to eliminate boar taint after reading it's description, significantly more consumers rated the immunization approach as acceptable compared to physical castration – 59% scored immunization in the top 3 responses for acceptability compared to only 25% for the physical castration method (Figure 1). While some degree of neutrality existed for both approaches- 33% and 52% of consumers being neutral in acceptability for the vaccination and physical castration approaches respectively, a clear difference is also shown in the bottom 3 responses representing unacceptability. Here 23% scored physical castration as unacceptable compared to 8% for the vaccine approach.

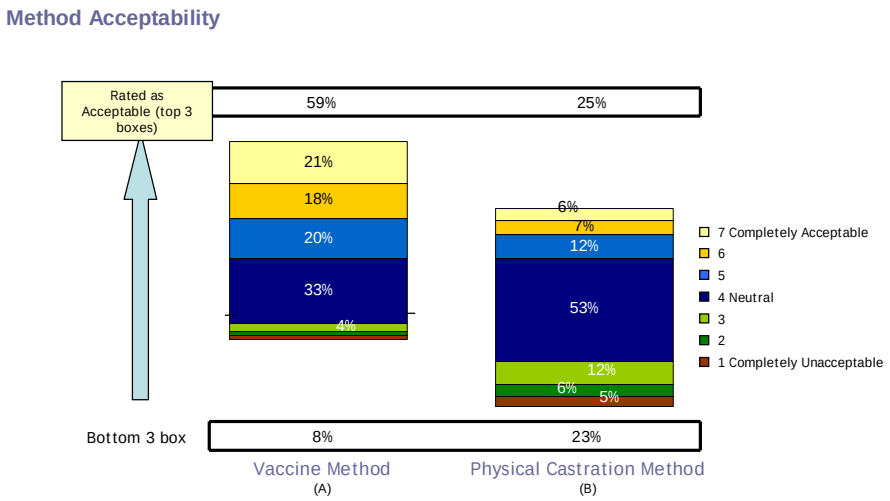

Figure 1: *Percentage of Korean respondents finding either physical castration or immunization acceptable*

The majority of consumers (74%) were unaware of the term boar taint. However after describing what boar taint is, this number decreased (57%) suggesting that consumers are more familiar with the concept of boar taint rather than the actual terminology. After describing boar taint 76% were concerned about its presence in pork and the need to ensure its removal. Those who were not concerned about this issue only represented 8% of the sample (Figure 2).

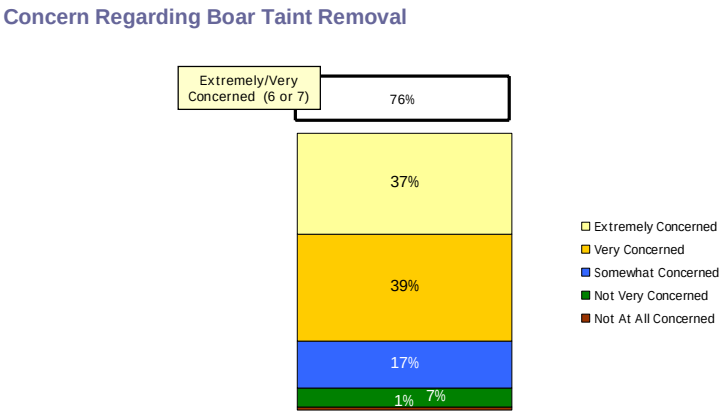

Figure 2: *Percentage of Korean respondents who were concerned with boar taint removal*

When asked about their preference for either method, 62% of consumers preferred the vaccination approach with another 21% being neutral. By comparison only 17% preferred the physical castration method (Figure 3). When asked about their attitude towards consuming pork produced with either method, 35% said they would try to only eat pork produced by the vaccination method; 47% said they were happy to eat pork produced with either method of taint control, while only 11% said they would try to eat only pork produced by the physical castration method.

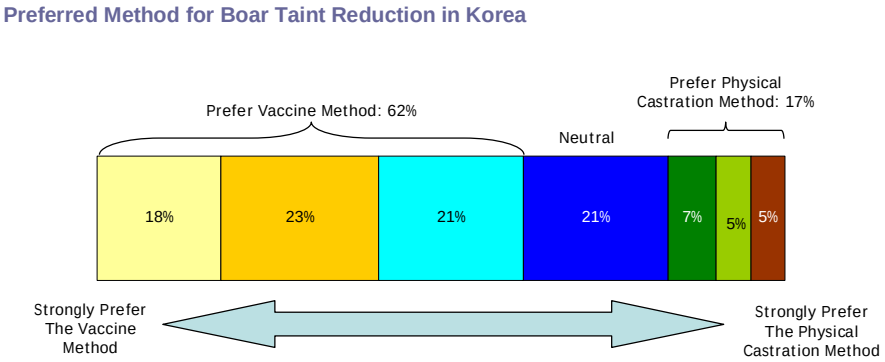

Figure 3: *Preference of Korean consumers for either immunization or physical castration as the preferred method of boar taint control.*

The findings of the Korean survey confirm the findings from a choice experiment survey of Swedish consumers (Lagerkvist 2006) as well as Swiss (Giffin, 2008) and Australian consumer research (Allison 2008). It is also consistent with recent research conducted in France, Germany and the Netherlands (Allison 2008) (Figure 4). Despite consumer unease about the use of new technologies in food production, participants in these surveys found vaccination to control boar taint to be preferable compared with physical castration, as long as there was equivalent taste quality.

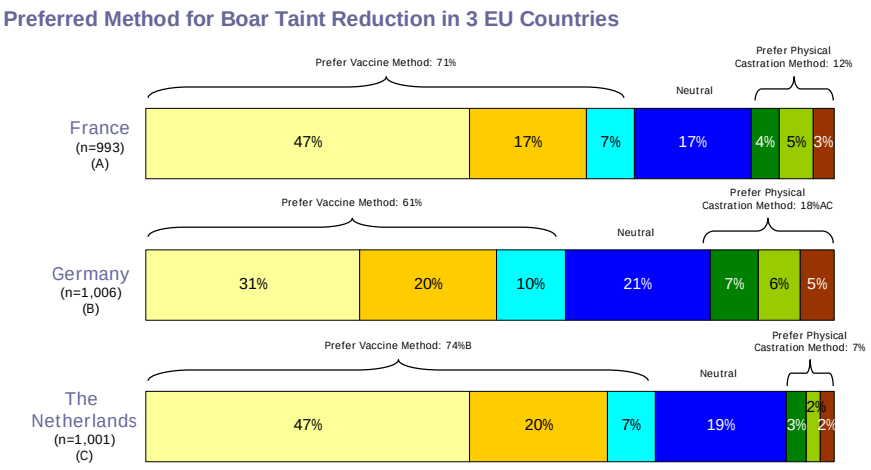

Figure 4: Preference of French (n=993), German (n=1006) and Dutch (n=1001) consumers for either immunization or physical castration as the preferred method of boar taint control.

IV. CONCLUSION

For several reasons it is desirable to find a substitute for the current practice of physical castration. While a number of potential alternatives exists, none is currently as reliable or practical as immunization against GnRF, which works by stimulating the development of antibodies that suppress testicular function and thus the development of boar taint.

From a scientific perspective the food safety of Improvac, the only commercially available product based on the above approach, is clear. The product contains a protein antigen that lacks any hormonal or pharmacological activity and is not active when given by mouth (Clarke et al., 2008). It leaves no residues in meat that can affect people and, in common with most vaccines, Improvac has been granted a zero day withdrawal period in the 56 countries where it is currently approved, reflecting the inherent lack of food safety concern. From a consumer psychology perspective, however, scientific data are not always sufficient to allay concerns. There is a tradition of consumer unease about the use of new technologies in food production globally.

Improvac provides an unusual case study in that consumer concerns can be addressed not only with scientific facts, but also by pointing to positive benefits to a range of stakeholders, including the treated pigs. Participants in the surveys reviewed in this paper found immunization to control boar taint to be preferable on animal welfare grounds compared with physical castration, as long as there was equivalent taste quality. The findings from this research are inline with several other studies conducted across the globe. The conclusions from the studies presented in this paper signal a positive acceptance for using immunization to control boar taint compared to physical castration. The overwhelming majority of participants in these surveys found immunization to control boar taint to be acceptable compared with physical castration, as long as there was equivalent taste quality.

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