Consumer Acceptance of the Use of Vaccination to Control Boar Taint

Allison, J.[1], Wright, N.[1], Martin, S.[2], Wilde, N.[3], Izumi, E.[3]

[1] Pfizer Animal Health, New York, USA, [2] Pfizer Animal Health, Paris, France,

[3] Lieberman Research Worldwide, Los Angeles, USA

e-mail: Stephan.Martin@Pfizer.com

Introduction

Global population growth and increasing demand for pig meat will continue to place pressure on the world's pork supply. To meet demand the pig industry must become more efficient. One way to increase production efficiency would be to raise boars rather than castrates [1]. However, pork from some boars can have an offensive smell and taste, known as 'boar taint'. Because of this most of the world's male pigs are physically castrated early in life. While this is effective is controlling boar taint there are issues with physical castration that make it undesirable. Compared to boars, castrates are less feed efficient, often grow slower and are fatter with less lean meat. In many countries, especially within Europe, there is also growing concern about the negative animal welfare aspects of physical castration, which is generally performed without the use of anaesthesia.

In an increasing number of countries an alternative approach to boar taint control, based on vaccination against Gonadotrophin Releasing Factor (GnRF) is now available. Antibodies induced by the vaccination neutralize natural GnRF thereby leading to a temporary suppression of testicular function in male pigs and the control of boar taint. As a replacement for physical castration the approach offers clear animal welfare advantages. It is also a profitable alternative for the pig producer, as the timing of vaccination allows male pigs to spend most of their fattening period growing as metabolically efficient boars. Full commercial implementation of the new method, however, also requires the agreement of others in the pork production chain, including, ultimately, the pork consumer.

Consumer acceptance has several different components. The most straightforward is satisfaction with food quality, which includes taste, appearance and nutritional value. These concerns can be addressed with scientific data and by personal experience. In the case of the available vaccine, Improvac®, multiple sensory studies have been reported and clearly demonstrate that pork from vaccinated boars is of equivalent sensory quality (odour, flavour, 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). [2, 3, 4, 5, 6]

Confidence in food safety is another aspect of consumer acceptance, and although fear of residues and harmful effects should theoretically be addressable with scientific data within the product licensing system, there is often an additional emotional component. In Europe especially, consumers have become cautious about accepting the introduction of new technologies in agriculture. Finally, consumer acceptance can also reflect public concerns about the methods used in food production, including their impact on animal welfare and the environment. Here there is complex interaction of personal values with scientific and emotional arguments.

This paper will review some of the evidence that demonstrates that the control of boar taint through the use of a vaccine is acceptable to consumers, in particular recent market research performed in Germany, France and the Netherlands. Indeed the evidence shows that the majority of consumers in these countries, when faced with a choice between physical castration and vaccination, prefer the vaccination approach to boar taint control.

Historical Results

The first introduction of Improvac was in Australia 10 years ago and consumer focus groups conducted at that time showed high acceptance of the concept.[7] In 2005, Lagerkvist et al conducted the first European consumer research in which 285 Swedish consumers completed a mail survey comparing their preferences for pork from either vaccinated boars (described in the survey as immnocastrated boars), physically castrated boars or from pork from non-castrated males in a willingness-to-pay choice experiment model [8]. The survey questionnaire investigated tradeoffs associated with animal welfare, taste quality and use of vaccines to control boar taint in pig production and concluded that immunocastration was a socially viable alternative to physical castration.

The boar taint vaccine, Improvac, has recently been approved for use in Switzerland and in preparation for market release a survey of Swiss consumers was conducted in late 2007. The protocol was similar to that used in other European countries which will be described later. Following on-line interviews with 971 Swiss consumers 78% considered vaccination to be an acceptable method of boar taint control and 77% preferred the approach to physical castration.[9]

European Union Consumer Research

Methodology

Studies in Germany, France and the Netherlands were commissioned by Pfizer Animal Health in early 2008 and performed by a leading market research company, Liebermann Research Worldwide, specializing in consumer research. Approximately 1000 on-line interviews were conducted per country, each lasting around 15 minutes. Respondents were the primary persons responsible for purchase and preparation of meat in their household, were all regular consumers of pork and were not associated with either pig production or the animal health industry.

The structure of the questionnaire, which was built on the experience gained during the conduct of the Swiss survey already mentioned, is described below:

Questionnaire

- Demographic information
- Current pork usage (important attributes)
- Boar taint
  - Existing knowledge
  - Attitudes after reading information
- Methods of boar taint control
  - Two methods : physical castration (with anaesthesia) and vaccination
  - First description provided (order varied)
    - Questions
  - Second description provided
    - Questions
- Method preference

Boar Taint – Knowledge and Attitudes

Figure 1 below shows that the majority of consumers in France and Germany had never heard of boar taint and that 49% of Dutch consumers also fell into this category. Only 8% of consumers in France and Germany, and 12% in Holland, felt that they knew a lot about the subject. Although the pattern is similar across all three countries the increased level of knowledge in Holland compared to the other two is statistically significant (note that the differences in superscripts indicating statistical significance reflect between country comparisons and should not be read across the rows).

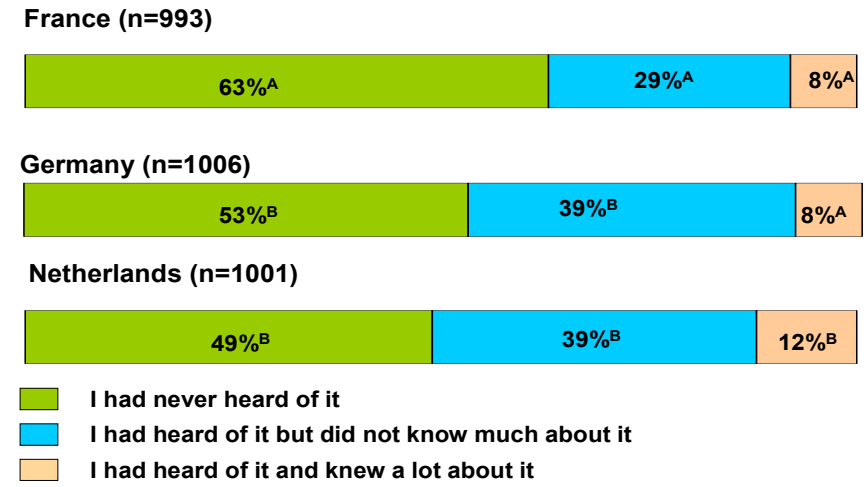

Figure 1: Prior knowledge of boar taint

After consumers were informed about the nature of boar taint a majority of consumers in France and Holland were extremely or very concerned that measures should be taken to prevent it occurring (Figure 2). Concern was less marked in Germany.

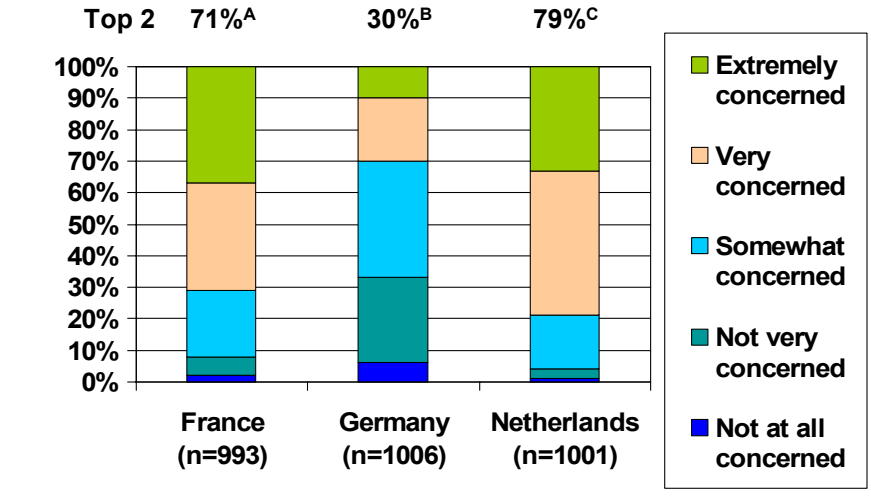

Figure 2: Concern about boar taint after provision of information

Physical Castration – Knowledge and Attitudes

The description of physical castration shown to consumers is summarized below. Although anaesthesia is not commonly used when castrating pigs in the countries surveyed anaesthesia was mentioned in the profile as it may become standard practice in the future, and indeed this is already planned in Holland.

Physical castration with anaesthesia

- Testicle removal by the farmer within the first week of life using a scalpel
- Anaesthetic techniques under evaluation
- The anaesthetic does not leave any residue in the meat
- 99%+ effective in taint control
- Pigs less aggressive and easier to manage
- Risk of infection and death from the procedure
- Pain and stress may be reduced by the use of anaesthesia, but may return once the anaesthesia wears off
- Castration reduces metabolic efficiency resulting in increased feed consumption and more waste production
- Meat contains more fat

The level of prior knowledge about physical castration is summarized in Figure 3. As might be expected, existing knowledge was low with a majority of consumers in both France and Germany being unaware that male pigs were routinely castrated in their country. This proportion was significantly lower in Holland and it can be speculated that this reflects the high level of publicity generated in the Dutch media after an initial awareness campaign by Dutch animal welfare groups on this topic.

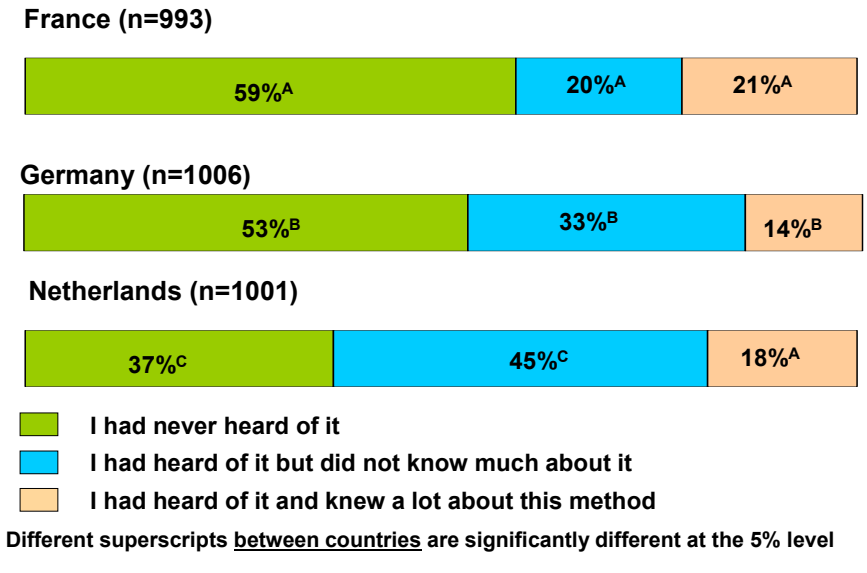

Figure 3: Prior knowledge about physical castration

Figure 4 summarizes opinions about the acceptability of the physical castration method. In all countries more people found the method unacceptable than found it acceptable. This was particularly so in France.

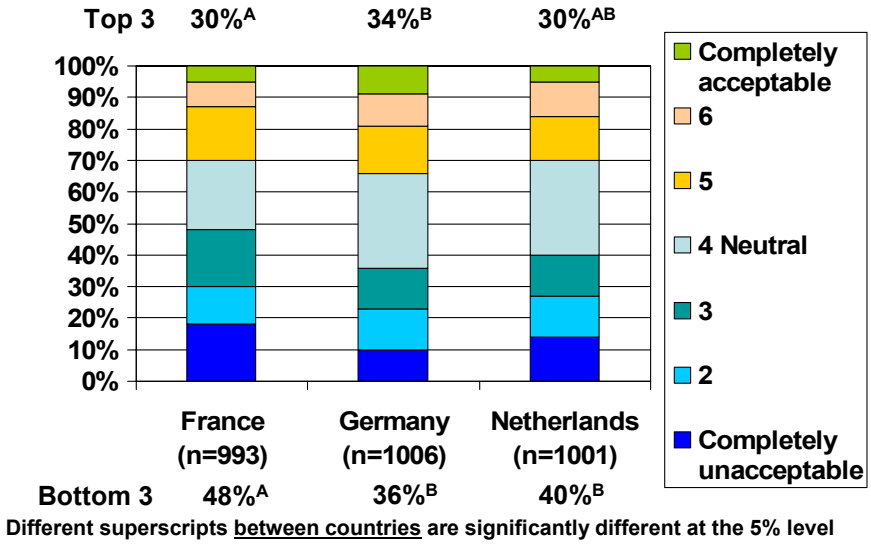

Figure 4: Method acceptability – physical castration with anaesthesia

Vaccination to Control Boar Taint – Knowledge and Attitudes

The description of the vaccination method shown to consumers is summarized below.

Vaccination

- Uses the pig's immune system to create antibodies that temporarily limit the function of the testicles
- 99%+ effective in boar taint control
- At the time of use will have been approved by the EU authorities
- Over 8 years of experience in Australia and NZ
- Leaves no detectable residues in the meat
- No pain, stress or health consequences associated with use
- Less food consumption and environmental waste
- Meat leaner than castrated pigs
- Farmers will need to ensure that every pig is vaccinated and use a safety vaccinator to minimize the risk of self-injection

The level of prior knowledge about vaccination is summarized in Figure 5. Not surprisingly, as the procedure in not in commercial use in the EU, most consumers had never heard of it, although 19% of Dutch consumers had at least some prior awareness.

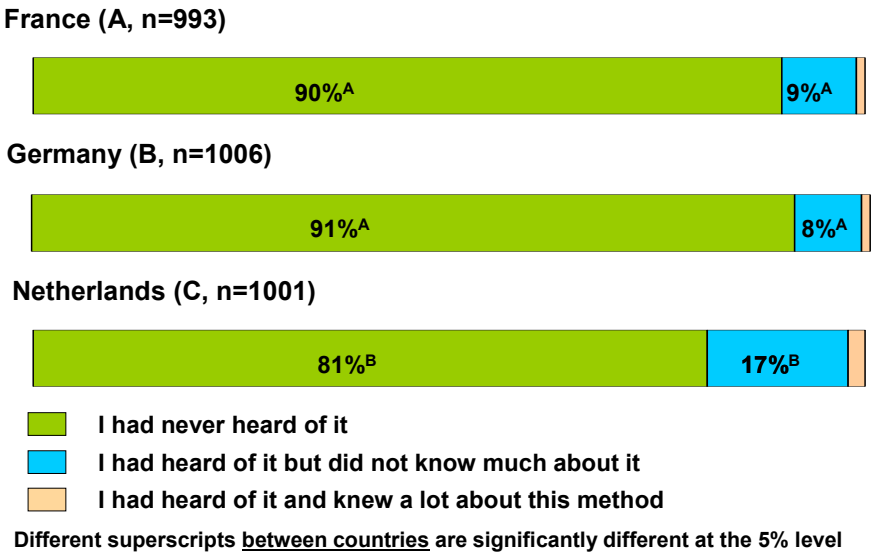

Figure 5: Prior knowledge about vaccination to control boar taint

The vaccination approach was considered acceptable by a majority of consumers in all three countries, with only a small proportion scoring the method below neutral. This proportion was particularly low in Holland.

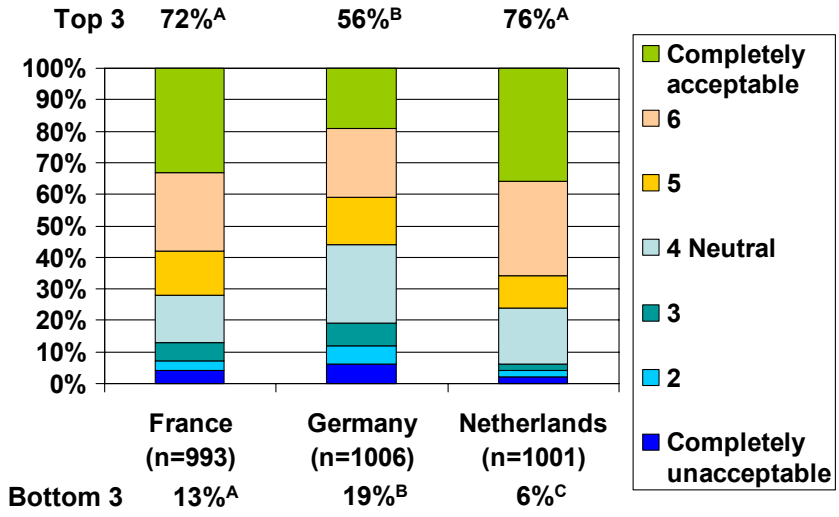

Figure 6: Method acceptability - vaccination

Method Preference

Consumers were asked for their preference between the two methods of boar taint control and these results are summarized in Figure 7. As a follow-up question consumers preferring the

vaccination method also were asked whether they would deliberately seek out pork produced in this way. These results are shown in Figure 8. The results show a consistent pattern of preference for the vaccination method, with preference for the alternative of physical castration with anaesthesia being significantly lower in Holland than elsewhere. Again, it can be speculated that this reflects the impact of information campaigns.

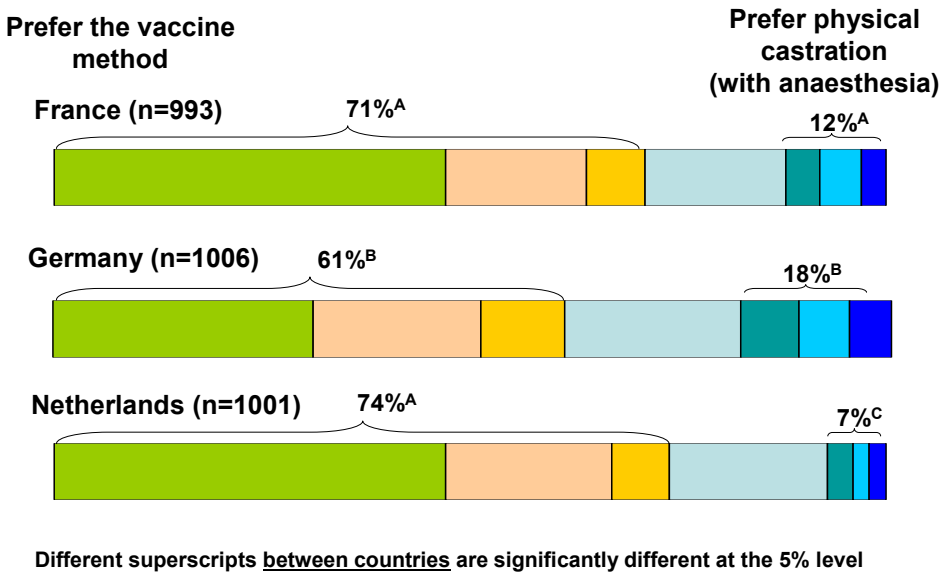

Figure 7: Preferred method for boar taint control

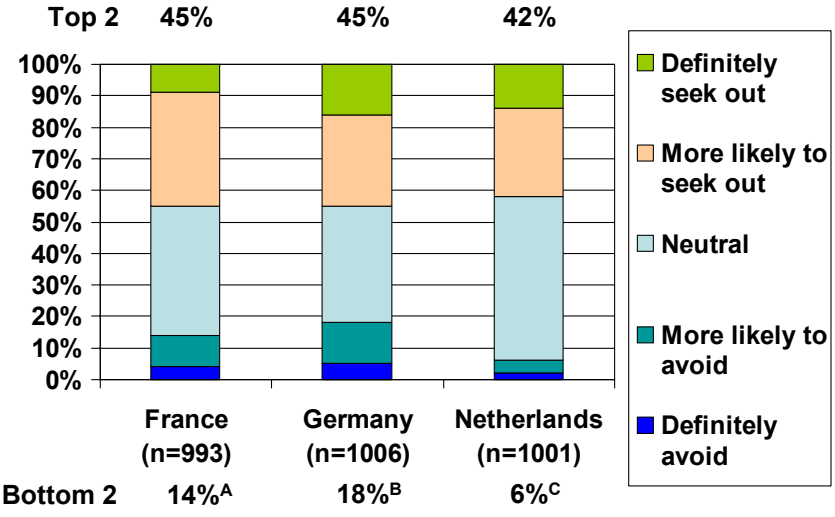

Figure 8: Likelihood of seeking out pork produced using the vaccination method for boar taint control

Summary and Conclusions

The results of the recent (2008) surveys conducted in France, Germany and Holland confirm that the level of existing knowledge amongst European consumers is low, not only

regarding the new option of vaccination to control boar taint, but also of the existing practice of physical castration. Prior awareness was, however, significantly higher in Holland than Germany and France and it is likely that this reflects the impact of very active animal welfare campaigns on the issue of piglet castration.

After provision of information, consumers showed high acceptance of the vaccination approach and a marked preference for vaccination over the alternative of physical castration, even with the use of anaesthesia. The difference in preference was particularly marked in Holland, suggesting that higher knowledge and familiarity may be associated with a re-enforcement of these trends. The outcome is also consistent with the results of previous research in Australia, Sweden and Switzerland.

Overall, it can be concluded that the vaccination approach to boar taint control appears to be acceptable to consumers and is preferred to current practice.

® Improvac is a registered trade mark of Pfizer

References

1. Dunshea, F. et al. (2001). Vaccination of boars with a GnRH vaccine (IMPROVAC®) eliminates boar taint and increases growth performance. J Anim. Sci. 2001. 79:2524-2535
2. Singayan-Fajardo, J et al., (2006). Eating quality and acceptability of pork from Improvac® vaccinated boars. Proceedings IPVS, Copenhagen, Denmark, 2006.
3. Jeong, J. et al. (2008). The effects of immunocastration on meat quality and sensory properties of pork loins. Proceedings IPVS, Durban, South Africa, 2008
4. Jeong, J. et al. (2008). The effects of immunocastration on meat quality and sensory properties of pork bellies. Proceedings IPVS, Durban, South Africa, 2008
5. Boghassian, V. et al. (1995). Immunocastration – A strategy to product taint free high quality pork from intact males. Proc 41st Int Cong Meat Sci & Tech August, 1995.
6. Lodge, N.J. et al (2008) Eating quality of pork loin steaks from entire lightweight boars and boars vaccinated with Improvac® Proceedings IPVS, Durban, South Africa, 2008
7. Hennessy, D & Newbold, R. (2004). Consumer attitudes to a boar taint vaccine, IMPROVAC – A qualitative study. Proceedings IPVS, Hamburg, Germany, 2004.
8. Lagerkvist, C. et al. (2006). Swedish consumer preferences for animal welfare and biotechnology: A choice experiment. AgBioBorum. 2006. 9(1):51-58
9. Giffin, B. et al. (2008). Consumer acceptance of the use of vaccination to control boar taint. Proceedings IPVS, Durban, South Africa, 2008