ECONOMIC ASPECTS OF IMMUNOCASTRATION IN THE PIGS

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Abstract. In modern pork production, male pigs are usually castrated because intact boars can develop boar taint in the meat. Castration is considered as a measure which deteriorates animal welfare. The goal of this study was to develop a model which can be used to estimate the costs and benefits of switching from the current castration practice to immunocastration. In the baseline scenario immunocastration was estimated to reduce the profits of the supply chain a little. However, the result was sensitive to several factors. In conclusion, economic incentives to adopt immunocastration depend on the production technology that is available and on meat procurement policy. Hence, coordination between farms and meat buyers is needed.

Key words: Pigs, castration, immunocastration, boar taint, production costs.

INTRODUCTION

In modern pork production, male pigs are usually castrated because intact boars can develop boar taint in the meat. Castration is considered as a measure which deteriorates animal welfare as it causes pain and inflammation in the animal. It is therefore criticized as a production practice and a group of stakeholders have agreed to cease traditional castration in Europe by year 2018. Boar taint is a characteristic undesired by the consumer. It is penetrating unpleasant odour and accompanying taste in pork which is developed before animals reach their conventional slaughter weight. If strong, it is associated with manure, urine and sweat. A person can only smell the odour when the meat is heated. The majority of a pig is destined for the fresh meat market, and hence the meat will be heated during the food preparation. The sensitivity of consumers to boar taint varies by country. A pan-European study suggests that a considerable proportion of consumers sense boar taint and dislike it, and the occurrence of boar taint in the meat can reduce their pork consumption.

Alternatives to traditional castration of male pigs have been presented. The alternatives include slaughtering the boars before the taint develops (i.e. at a lower weight) or immunocastration. Studies suggest that the consumers are indifferent between meat from castrated pigs and meat from boars that did pass the boar taint detection test at the slaughter line. Immunocastration is a procedure in which the young male pigs vaccinated against boar taint. The vaccine binds to pig’s own circulating GnrH inactivating it, this determines the reduction of androstenone production in the testicles. The outcome is reduction of testicle growth and absence of boar taint in the meat.

One of the challenges in implementing immunocastration is that it may increase operating costs throughout the supply chain. Additional costs may be incurred at pig finishing farm, animal transportation and slaughterhouse. Hence, it isn’t just a single pig farm that is affected, but there may be also other businesses which can benefit or suffer economic losses from immunocastration.

Until now, studies have examined economics of alternative castration methods mainly as a farm-level problem. However, there several stakeholders which castration method used by a farrowing farm can affect, and therefore it should be examined by taking into account the views of these stakeholders.

The goal of this study was to develop a model which can be used to estimate the costs and benefits of switching from the current castration practice to immunocastration. This study contributes to the literature by examining the issue from the viewpoint of several stakeholders. We analyze economic incentives of stakeholders to apply immunocastration under different scenarios regarding logistical organization of the supply chain, slaughterhouse meat pricing scheme, and farm type.
MATERIALS AND METHODS

The data were biological data from an animal experiment conducted at an experimental farm in Finland and economic data retrieved from statistics. A value chain simulation model was developed to assess the financial impacts of alternative castration practices. The model had three stakeholders: a piglet producer, a finishing farm and a slaughterhouse buying the pigs. Each stakeholder was assumed to maximize their gross margin (revenues minus variable costs, assuming that the investments on production capacity have already been made).

RESULTS AND DISCUSSION

In the baseline scenario immunocastration was estimated to reduce the profits of the supply chain. However, the net effects were quite small as the total extra costs were estimated approximately at €1 per metric ton of pigmeat from male pigs.

Analysis of various scenarios illustrated that the results were sensitive to a number of variables. Although immunocastrated pigs produced leaner meat and they were more efficient in producing meat at a finishing farm, additional costs due to immunocastration were incurred both at the finishing stage and along the supply chain. Moreover, savings in the costs of avoiding traditional castration were only marginal.

In the baseline scenario the slaughterhouse paid the same price for both castrated and immunocastrated pigs, immunocastrated pigs’ logistics were separated from female pigs and the slaughterhouse hired extra staff designated to handle and inspect immunocastrated pigs.

The results suggest that the integration of the supply chain is vital to the adoption of immunocastration as a production practice. Two factors appear to be of special importance. First, currently major slaughterhouses in Finland pay a significantly reduced price for boars’ meat, including meat from immunocastrated boars. The results suggest that for farms to have economic incentives to start widespread use of immunocastration requires that a slaughterhouse adjusts pricing scheme so that all immunocastrated pigs (including those which vaccination might be unsuccessful) would be procured according to the same price list as castrated male pigs.

Second, if the rearing of male and female pigs must be separated to benefit from immunocastration, then the production units should be large enough to avoid unnecessary costs or have suitable production technology in place. The results suggest that immunocastration would be best suited to farrowing-to-finishing operations or to large nearby specialized farms which have integrated their operations e.g. through contracting, or to large farms which have feeding technology capable for differentiating feed supply by compartments. Given that the meat is producer at regular price, in these cases immunocastration could provide additional value-added of approximately €21 per metric ton of pigmeat.

CONCLUSIONS

In conclusion, economic incentives to adopt immunocastration depend on the production technology that is available and on meat procurement policy. Hence, coordination between farms and meat buyers is needed. It could be an opportunity also for a niche market company. If these issues can be solved, immunocastration is economically more attractive option that the use of reduced slaughter weight.

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