IMMUNOCASTRATION IN SWINE: A PRACTICAL APPROACH

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ABSTRACT

To succeed in adopting the immunocastration process it is necessary to be alert to a series of components within and outside the pork production system. From the regulatory environment, slaughterhouses, veterinary pharmacies, farms, labor through to the final consumer should be considered when evaluating and routinely using this tool. Prior to routinely adopting the technique, analyses should include environmental legislation, slaughterhouses and farm structure and work routine, veterinary pharmacies, manpower and the final consumer.

INTRODUCTION

Immunocastration in pigs is a new technology that is being increasingly adopted worldwide, on a day by day basis. For those who do not have all the information about this technique it seems to be like any other vaccination process, but it is much more than this. The aim of this article is to share the Brazilian experience that our country and, especially, our company, is having in adopting this technique.

VACCINATION TEAM

1. Attraction and selection of people

The vaccination team is a crucial part for the successful adoption of immunocastration. Given the complexity of questions to be observed it is suggested to recruit agriculture technicians due to their training and vocation. It is important to have a career plan for them, with the possibility of use of such team members in the technical assistance for farmers in client companies.

2. Training and capacity building

It is important that those involved in the task have the knowledge of male physiology and ethology as well as semiology. They need to understand how the tool works, how to apply it and what are the expected and unexpected results. It is also important to share with them concepts of ergonomics and gymnastics at work as well defensive driving.
3. Productivity and efficiency

There are differences in the skill level for each task among team members. Nevertheless, it is necessary to do the job rotation to avoid fatigue and minimize the risk of accidents. The team size should consider clearances and daily work journey not too long. A key aspect in the optimization of resources is the correct setting of the weekly work schedule.

4. Tasks and functions

There are several items: preparation of the schedule, driver, inventory management, cleaning and maintenance of equipment, preparation of doses in syringes, restraint of animals, product application and inspection for the need of the third dose.

5. Personal protective equipment

For the protection of employees and due to the labor laws it is necessary to wear dust masks, noise dampers, gloves, waterproof disposable pens and hard protection from the knees to the ankles and boots. The uniform should be comfortable and compatible with the climate of the region.

6. Controls and assessment points

Temperature of vaccines in storage equipment, number of applied doses, incidence of local reactions, abscesses and needle breakage are the main monitoring items.

7. Accidents

Field experience suggests that the risk of self-injection is small. Although no direct studies on humans have been conducted, extensive animal studies and scientific knowledge about this type of product suggest that a single injection will have no major clinical effect beyond any pain and injury associated with the injection itself. A single injection, however, may prime the immune system to react to subsequent injections, in the same way it does in the pig. As a precaution it is suggested that the person should be removed from the task of handling / applying the product (Improvac FAQ’s website).

FARMS AND PRODUCTION SITES

1. Loading strategy

Sexed accommodation facilitates the work because it reduces the number of sites to be visited for the application. This could, as an inconvenience, increase the number of sources of piglets to make a batch.
2. Site and time of the first dose

It is possible to apply the first dose of the product already in the nursery phase until the finishing phase. This flexibility allows adaptation to different realities of production structure. There is no performance difference in choosing the different moments of the first dose.

3. Infrastructure for animal containment

It is essential that the stalls and walls allow the use of the boards for management to separate the animals that will receive the vaccine from the others that already received. This greatly facilitates the workflow within pens.

4. Quality control

Producers are recommended to conduct weekly inspections of all immunized animals at around two weeks after the second dose. The aim is to detect any animal which may not have been successfully immunized. Testicle size and appearance are excellent visual indicators of a successful immunocastration. Testicles are generally a half to one-third of the size of those of a non-immunized boar, and less prominent in the scrotum. Signs of large, reddened testicles or repeated/ prolonged mounting and thrusting indicate sexual activity and suggest that the pig may not have been given one of its two doses. These animals should be given an additional dose straightaway (Hennessy, 2006).

5. Abscesses

Like any injectable product, the risk of occurrence of abscesses exists. The application site and the depth in which it presents are characteristic. Usually its occurrence is associated with the application in non-hygienically raised animals.

VETERINARY PHARMACY

1. Cooling structure

The refrigerator must be capable of generating cold enough to meet demand considering the frequency of delivery plus a margin of safety. It must have an electronic system for reading and recording temperature and, depending on size, an alarm system with automatic phone call plus a stationary fuel powered electric energy generator for backup purposes on power outages.

2. Different number of doses per bottle

To avoid waste of product due to the difference between number of doses versus number of animals at field; and the potential risks associated with the breakdown of farm biosecurity policies by sharing products; it is important to purchase more than one size of bottle to match more precisely what was planned with what will be carried out.
3. Contingency stock

According to the lead time of the product and risks related with the discontinuity of supply it is necessary to have an agreement between customer and supplier to ensure a safety stock for contingencies.

4. Special syringes

The applicator should be safe, functional and durable. It must be constructed to minimize the risk of injury or self-application, and must be comfortable to use for long periods. The use of bottle rack attached to the body gives a good autonomy between refilling. The equipment with two stages of pressure to dispense the product is very safe. There is a possibility of using automated systems to gain in number of vaccinated animals per man per hour.

SLAUGHTERHOUSE

1. Phased-in at pork plants

Slaughter of immunocastrated animals could be phased-in by federal inspection initially accepting immunocastrated animals only on specific days of the week and times of the day.

2. New tasks for slaughterhouse

New functions could be provided within the slaughter line. An employee could be responsible for measuring and the separation of animals with testicle’s size larger than 110mm and the cooking test for fat of these suspected of having boar taint. Another one could be in charge of removing the testicles and accessory glands of the reproductive tract.

3. What about testicles?

As a byproduct immunocastration generates the testicles, which must have a destination. In many places the testicles are used for cooking. Rocky Mountain oysters, mountain oysters, prairie oysters, Montana tender groin or swinging sirloin are North American culinary names given to buffalo, boar or bull testicles. They are usually peeled, coated in flour, pepper and salt, sometimes pounded flat and then deep-fried (Popik, 2008).

4. Field against industry?

According to genetics, slaughter weight and destination of animals for carcasses or cuts the gain can vary. It must apply a systemic view of the business to sometimes accept the investment in one area to gain more in another.
FEDERAL INSPECTION

1. Deal with national legislation

The national legislation may not allow the slaughter of boars. The European Community legislation decrees that carcasses from boars that are over 80kg may only be allowed to be used for human consumption provided they are processed, used in small goods, or tested for taint (Council Directive 64/433/EEC of 26 June 1964). There are specific rules for that organization of official controls on products of animal origin intended for human consumption. Meat is to be declared unfit for human consumption if it: indicates patho-physiological changes, anomalies in consistency, insufficient bleeding (except for wild game) or organoleptic anomalies, in particular a pronounced sexual odor (Regulation Number 854/2004 of the European Parliament and of the Council of 29 April 2004).

2. Interaction with government veterinarians

They need to receive all technical information related to the technology as well all the related laws. They can help advising and asking for possible adjustment in the slaughter line and / or equipment for analysis of suspected animals. There may be some specific procedures or documentation needs for the qualification of each plant to slaughter boars.

CUSTOMER

1. Appeal for animal welfare

In Europe, increasing interest in farming practices has highlighted the welfare issues surrounding this form of castration and has consequently increased the pressure on legislators to introduce controls (Campbell, 2006). Immunocastration generates a marked reduction in mounting behavior and aggression. Doing a comparison of aggressive behavior frequency and sexual behavior frequency 3 weeks after second dose between immunocastrated, castrated and entire boars, the first two are equal and statistically lower than the last (Cronin et al., 2003). This has resulted in less mortality due to lameness, downer pigs and fighting, and lower slaughterhouse rejections with a reduction in death loss and culls in males of 3-5% (Brennan, 2009).

2. Food safety

Pigs that were administered the vaccine orally had no detectable antibody response or interference with normal hormone levels. This provides strong evidence that hypothetical human consumption of vaccine residues would not induce antibodies to GnRF or have any secondary endocrinological effect. Oral administration to rats showed that the vaccine against GnRF is toxicologically innocuous even when it was given at a relative dose of 70 times that recommended by subcutaneous injection for pigs. Injection of the GnRF conjugate showed that this antigen has no intrinsic hormonal activity. The complete lack of hormonal activity of the antigen provides compelling evidence that no direct hormonal effect could occur from the
hypothetical human consumption of antigen in the meat from a vaccinated animal (Clarke, 2008).

3. Sensory Evaluation

A survey of Brazilian consumers was designed to understand consumer’s attitudes towards vaccination to control boar taint as an alternative to physical castration. Regarding the sensory evaluation were found significant differences ($p < 0.05$) for all sensory attributes evaluated in favor of immunocastrated pigs when compared with physically castrated. The preference test applied to cooked sirloin steak from immunocastrated pigs indicated better preference (66%) compared with physically castrated (34%). The panelists “intent to purchase” was also in favor of the immunocastrated treatment and confirmed the results from the preference and acceptance tests. The majority (74.8%) of the consumers probably (20.2%) or certainly (54.6%) would buy meat from the immunocastrated pigs compared to 58.4% of the consumers who probably (25.2%) or certainly (33.2%) would buy meat from physically castrated pigs (Tonietti, 2008).

CONCLUSION

Immunocastration is a practice that requires some planning for the implementation and for the consequent results to occur within expectations. We must consider all links in the chain of production to study the adoption, not only in terms of profitability; but also acceptance by today’s and tomorrow’s customers of pork meat and for the sustainability of pig farming.

REFERENCES


