

# The opinion of the production sector on the role of vaccines in the control and eradication of livestock diseases in Argentina

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## Summary

Research by a number of international organisations indicates that world demand for red meat protein is set to increase significantly in the coming years. However, faced with the risk of infectious animal diseases and zoonoses – factors that could limit the growth of this production sector – the fight against livestock diseases must continue, especially against those that affect food safety or pose a threat to human life. The use of vaccination to prevent infectious animal diseases is of key importance, not only because it helps to control and effectively eradicate infectious livestock diseases, but also because it makes it possible to introduce new technologies for intensive or semi-intensive production, to protect the environment, to care for animal welfare and to guarantee the safety of animal-derived foodstuffs.

As part of their professional culture, livestock producers have come to fully appreciate the advantages of using vaccination to prevent disease rather than curative measures, which are more costly to implement and in some cases not very effective. The control of anthrax and rabies by means of effective vaccines was a factor in the widespread development of livestock in Argentina and other parts of Latin America. Recent results in the control and eradication of foot and mouth disease have made producers even more convinced of the merits of this technology.

Animal disease prevention has proven to be highly conducive to the production of healthy foodstuffs. It is the responsibility of international organisations to draw up appropriate regulations to protect trade, supply safe and healthy products and prevent the application of unjustified non-tariff measures.

## Keywords

Animal disease – Argentina – Control – Eradication – International trade – Livestock producer – Vaccination – Vaccine.

## Introduction

Cattle, which were introduced into America from Europe at the time of the Spanish conquest in the 15th Century, went on to breed easily in various regions of the Americas. Their numbers grew to unparalleled proportions in the River Plate region, which covers vast areas of Argentina,

Uruguay, Paraguay and southern Brazil. There was a huge natural increase in the livestock population in the Argentine grasslands, especially during the 16th and 17th centuries, so much so that by the early 18th Century the estimated population was similar to that of the present day (56 million head). Up until then no technological improvements had yet been introduced into livestock production, which was 100% pastoral (4).

Livestock production was the main engine of the Argentine economy up until the mid-20th Century. Livestock producers were able to play the key role in this development thanks to new technology for genetic improvement, the introduction of fencing, improved animal feeding techniques, the development and application of agrochemicals and fertilisers, the production of modern farming machinery, and, finally, public sector initiatives to control livestock diseases, which received unstinting support from livestock organisations and producers.

According to studies by specialised international organisations, half of the world's population earns less than two dollars per person per day (although one third of this population, particularly in Asia and Latin America, is due to increase its income significantly over the next twenty years). What is more, 75% of the 1.2 billion or so people subsisting on less than one dollar per day live and work in rural areas of developing countries (1). Although world demand for red meat protein is set to increase significantly over the coming years, one of the main constraints on meeting this demand will be the occurrence of infectious animal diseases and in particular zoonoses (3). Production rates must therefore be increased and livestock diseases reduced or eradicated, especially those affecting food safety or posing a threat to human life. The prevention of infectious animal diseases by means of vaccination is paramount to safeguarding human life, not only because it helps to control and effectively eradicate infectious livestock diseases, but also because it makes it possible to introduce new technologies for intensive or semi-intensive production, to protect the environment, to meet animal welfare requirements and to guarantee the safety of animal-derived foodstuffs.

## The livestock sector and the use of vaccination

The livestock production sector in Argentina (and the River Plate region as a whole) has taken an active part in the process of technology introduction to improve production conditions, especially health conditions, and in the early 20th Century it began to use a number of tools enabling it to overcome some serious health obstacles.

In the past fifty years, the production sector has grouped itself into local animal health committees (*Comisiones Locales de Sanidad Animal*) in every area of the country. The committees work jointly with official veterinary sector representatives on schemes for the early diagnosis of diseases, especially foot and mouth disease, and for monitoring vaccination campaigns against foot and mouth and other livestock diseases. These local committees,

which are organised and operate much like animal health groups (*Grupos de Defensa Sanitaria*) in other countries, work in a coordinated manner at regional and national level, facilitating the implementation of disease programmes.

## The example of foot and mouth disease

The success achieved in controlling and eradicating foot and mouth disease in Argentina in the 1990s and the speedy control and eradication of subsequent events were attributable to three key factors:

- a) a realistic control and eradication plan
- b) an excellent quality vaccine (safe, potent and pure)
- c) the resolute and committed participation of production sectors.

This convinced all stakeholders of the benefit of using vaccination to control foot and mouth disease.

The first reports of foot and mouth disease in Argentina were documented in 1890. The disease was present in the country up until the late 1980s and was endemic throughout much of Argentina. Thereafter, the private sector, working together with the health authorities, began to take decisive action and to actively participate in strategic actions to control foot and mouth disease. Major health changes began to be observed in affected regions covered by the National Control and Eradication Programme, with a drastic reduction in prevalence in affected herds, showing that the programme was working well.

Bi-annual administration of the foot and mouth disease vaccine with an oily adjuvant by the official Veterinary Services, paid for by livestock producers, extended the protection period and facilitated the effective surveillance of all farms and herds (around 100% vaccine coverage against foot and mouth virus serotypes A, O and C for more than eight years).

Furthermore, the involvement of producers and producer organisations guaranteed the continuity of programme activities and was one of the key factors in arresting and ultimately eradicating the disease.

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rabies by means of highly effective vaccines facilitated the widespread development of livestock in Argentina and the rest of Latin America. Recent results in the control and eradication of foot and mouth disease have made producers even more convinced of the merits of this technology.

Throughout this process, livestock producers have always relied on the professional advice of veterinarians and of the official Veterinary Services. Indeed, this tripartite relationship is the key to successfully implementing any disease prevention action.

## Modernisation of the sector

Nowadays, increasing world demand for protein poses a greater challenge to livestock producers. They know that their production must satisfy basic environmental conservation criteria, whilst world climate change determines the movement of their production to other latitudes, with different ecosystems, where there is a growing threat of emerging and re-emerging infectious animal diseases (for the most part zoonoses). All these factors, coupled with greater demand for food safety, have led producers to play a growing and committed role in the introduction of new production technology.

Any economically sustainable development of livestock production, including access to international markets, is therefore inconceivable without the use of vaccines and of effective biosafety measures for the prevention, control and eradication of infectious livestock diseases. For this to happen, international animal health regulations must take into account scientific advances in the field and reflect the state of the art, bearing in mind that livestock producers are unconditional allies in animal health management and animal production food safety.

However, these standards and recommendations must clearly reflect the optimum use of vaccination technologies in disease prevention and control, including their limitations, which in some cases may appear insurmountable in the current state of knowledge. One example is brucellosis control, where vaccination plans and the destruction of reactor animals are a necessary and economically valid prerequisite for definitively controlling and eradicating the disease, particularly among dairy herds.

Clearly, the use of stamping out measures to control and eradicate livestock diseases poses ethical and environmental problems. The recent episodes in Europe (foot and mouth disease in the United Kingdom and the Netherlands), Asia and Africa (avian influenza) have demonstrated the serious limitations of stamping out

measures. The slaughter and destruction of thousands of 'healthy' animals (2) and the subsequent environmental damage caused by the disposal of their remains (as in the case of cattle during the bovine spongiform encephalopathy epidemic in Europe) elicited a profoundly negative reaction among world public opinion. Fortunately, major changes have occurred in this area, such as the Dutch Farmers' Union proposal to use vaccination to control the 2001 foot and mouth disease outbreak in the Netherlands.

These episodes also revealed that animal welfare conditions had been severely undermined. However, livestock producers are the first link in the chain for proper implementation of animal welfare practices: the animals belong to them – animals which they breed, select and care for – and it is they who are ultimately responsible for what happens to their animals.

## The producers' standpoint

Argentina's livestock producers played an active and committed role in conjunction with the official veterinary sector in a successful ten-year programme for the control and eradication of foot and mouth disease, applying preventive vaccination to the entire cattle population in accordance with the international standards and recommendations of the World Organisation for Animal Health (OIE). In 2000, Argentina completed the eradication process and received international recognition of its status by the OIE, proving, together with other countries and regions in the Americas, that the route mapped out by the OIE was indeed feasible (5).

Fortunately, a number of important measures continued to be taken after the disease was eradicated: the surveillance and warning system was maintained, vaccine was produced on an industrial scale and an antigen/vaccine bank was set up. All this enabled Argentina to respond rapidly when foot and mouth disease recurred in the region and to use emergency vaccination to bring the disease under control in less than one year, leading to the recovery of Argentina's foot and mouth disease status in 2002. All these measures were taken without eliciting a negative response from the public, without affecting the environment by the mass destruction of animals and with no economic impact on livestock producers, who were able to continue maintaining and increasing their herds in compliance with strict biosafety and animal welfare standards. Argentina's livestock producers are proud of this achievement and believe it demonstrates their efficiency, something which would not have been possible without the aid of a good preventive tool and an excellent vaccination programme. The investment in an antigen/vaccine bank has turned out to be amply justified

economically, in view of the success in recovering markets and production value. Other examples in other parts of the world concerning other livestock diseases have yielded the same results, to the great satisfaction of livestock producers in those countries.

## Conclusion

In summary, it is livestock producers' opinion that, over the years, the use of vaccines has proven to be an excellent technological tool in preventing livestock diseases.

However, producers acknowledge that vaccines and their use should be subject to a series of basic requirements:

- a) vaccines must comply with international regulations (OIE), which are considered to be minimum standards
- b) vaccines must be safe and should not jeopardise food safety in any way. No discrimination must be made between products from vaccinated infection-free animals and the same products from unvaccinated infection-free animals
- c) vaccines used preventively should guarantee a long immunity period, preferably for life. To achieve the desired outcomes, basic research on the subject will need to be promoted and encouraged
- d) vaccines should be stable and effective under environmental extremes of cold and heat
- e) vaccines should be reasonably priced to enable their use even in countries/regions with scarce economic resources.

Meeting growing world demand for foodstuffs, particularly from the poorest countries, is acknowledged to be one of the responsibilities of livestock producers, together with other sectors. In economic terms, producers know how to produce more and better products (healthier foodstuffs).

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Based on their experience of controlling various epizootics, livestock producers will therefore continue to work actively with the official Veterinary Services and private veterinarians to control and eradicate livestock diseases.

The need to guarantee healthy foodstuffs, in compliance with new standards on animal production food safety, is a challenge for disease prevention programmes. Nowadays livestock producers have two basic technologies at their disposal: biosafety and preventive vaccination. Biosafety, which can be implemented efficiently in integrated production systems, is very expensive to set up and maintain, whereas preventive vaccination, which can be implemented in all production systems, tends to be cheaper. The recommendations of international organisations must be followed in order to ensure the proper and efficient implementation of the two systems and so facilitate market access for safe and healthy products. Clearly, these standards, which are based on leading-edge technology, do not introduce tariff measures.

The current vaccination strategy, which consists of vaccinating the entire herd with an immunogen that is extremely pure as regards non-structural proteins, serves as a guarantee for hazard-free trade in animals and animal products from free countries practising vaccination to free countries without vaccination.

Only if this type of strategy is used will vaccination be able to play its role in the prevention, control and eradication of livestock diseases.

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