

Veterinary Official Controls and Public Health



Abstract

Effective veterinary official controls are vital to maintain and improve the standards of animal health and welfare, as well as human health. Trade and economic growth can also benefit from the prevention and control of animal disease incursions. Although globally, the major goals of veterinary official controls are similar, the strategies used to achieve them may differ. It is important to recognise that risks and priorities are varied and countries should analyse them in order to be able to implement the most idoneous intervention strategies that suit their needs and capacities.

Veterinary professionals play a pivotal role in the protection of human health by protecting animal health and welfare. Undoubtedly, it cannot all be done by veterinarians and to succeed in reducing the risk of diseases there is a need to collaborate with other health professionals and paraprofessionals. Thus, good communication skills and the ability to work effectively in transdisciplinary teams are essential skills to reach the goal of improving both human and animal health. Though all veterinarians, in one way or another, take part in public health, one of the most visible veterinary roles in this area is the one played by veterinarians working in official controls, including inspections at slaughterhouse level.

The official meat inspection system is known to be a valuable tool for general surveillance of animal diseases and monitoring of specific animal health and welfare issues. In European Union member states (EU MS) the main components of the current official controls in slaughterhouses include the analysis of the food chain information (FCI), ante-mortem inspection of animals and post-mortem inspection of carcasses and organs. These three mechanisms are useful not only to monitor animal health and welfare and to reduce human health risks, but also to keep the traceability of food products from animal origin for human consumption from farm to fork.

Between 2011 and 2013 the European Food Safety Authority (EFSA) released four scientific inspections in a bovine slaughterhouse. Photo: Rodrigo Nova.

opinions on the public health hazards to be covered by inspection of meat (bovine, swine, sheep and goat and poultry). These reports show that the main biological hazards of public health relevance associated to meat consumption may not be detected by the current official controls in EU MS slaughterhouses. That is mainly due to changes in the prevalence of some zoonotic conditions in food-producing animals. An example is the currently low prevalence of *Trichinella spiralis* infection in pigs. Approximately 250 million pigs are slaughtered for human consumption in the EU (EU-28) annually, producing more than 20 million tons of pork. In contrast, according to EFSA and the European Centre for Diseases Control and Prevention (ECDC), only 217 human cases of trichinellosis were reported in 2013, most of them related to backyard production and home slaughter for private consumption where biosecurity measures for rearing pigs may not be as stringent as in commercial production.

Currently in the EU, the aetiological agents related to the largest proportion of the zoonotic foodborne outbreaks in the EU are *Campylobacter* (>200 thousand reported cases in 2013) and *Salmonella* spp. (approx. 82 thousand cases reported in 2013). Certainly ante-mortem official inspection allows identifying animals with visible faecal contamination on their hides, which could facilitate the decision of implementing steps in the process to minimise the risk of cross-contamination with bacteria



of the Enterobacteriaceae group (Figure 1). Nonetheless, the presence or absence of these microorganisms cannot be identified through traditional ante- or post-mortem official controls. In fact, that statement applies to all the aetiological agents considered by EFSA as a high priority public health biological hazard attributed to consumption of meat (Table 1).

Some aspects of the post-mortem official controls in food-producing animals are relevant for the assessment of animal welfare (Figure 2). However, palpation and incision of carcasses from animals which could be long-term sub-clinical carriers of microorganisms such as *Yersinia* spp., *Salmonella* spp. or verotoxigenic *Escherichia coli* (VTEC) may result in an increased risk of cross-contamination of carcasses with these pathogens, rather than reducing the risk of traditional zoonotic diseases such as cysticercosis and trichinellosis. As a result, currently the post-mortem official inspection of most pigs in EU MS is only visual.

The World Health Organisation (WHO) measures the overall disease burden as disability-adjusted life years (DALYs), where one DALY represents one lost year of healthy life. In order to calculate DALYs it is necessary to add the years of life lost (YLL) (discounting value for future years of life lost to premature mortality in the population) and the years lost due to disability (YLD) (discounting healthy life lost for morbidity and disability). The real health burden of foodborne diseases is not exactly known; nevertheless, the WHO has made a great effort to estimate the global burden of foodborne diseases. The WHO report on the global burden of foodborne diseases shows that the main conditions contributing to the burden vary between world regions. It is estimated that 40% of the total foodborne disease burden is on children under five years old.

In several developing countries the elimination of traditional post-mortem inspection protocols in food-producing animals is not a viable option. Certainly post-mortem inspection targeting parasitic conditions such as *C. bovis* and *C. cellulosa* has a low sensitivity, but for some developing countries where these conditions



Figure 2: Spinal abscesses associated to tail biting, identified during post-mortem inspection in a pig slaughterhouse. Photo: Rodrigo Nova.

could be found in nearly half of the slaughtered animals, traditional inspection remains as one of the few available methods for surveillance. The removal of that mandatory inspection could result in a higher health risk for the consumers and an increase in the DALY due to foodborne illness in these nations.

Veterinary official controls cover not only slaughterhouse inspection, but wider areas of animal health and welfare. It is clear that the priorities of veterinary official controls differ between countries. Also,

Priority	Bovines	Swine	Sheep and goats	Poultry
High	<i>Salmonella</i> spp. <i>Escherichia coli</i> (VTEC*)	<i>Salmonella</i> spp	<i>Toxoplasma gondii</i> <i>Escherichia coli</i> (VTEC*)	<i>Campylobacter</i> spp. <i>Salmonella</i> spp.
Medium		<i>Yersinia enterocolitica</i> <i>Toxoplasma gondii</i> <i>Trichinella</i> spp.		<i>Escherichia coli</i> (ESBL/AmpC**) (medium to high). <i>Salmonella</i> spp. (low to medium).
Low	<i>Bacillus anthracis</i> <i>Campylobacter</i> spp. (thermophilic) <i>Sarcocystis hominis</i> <i>Taenia saginata</i>		<i>Bacillus anthracis</i> <i>Campylobacter</i> spp. (thermophilic) <i>Salmonella</i> spp.	
Undetermined				<i>Toxoplasma gondii</i> <i>Escherichia coli</i> (ESBL/AmpC*)

* Pathogenic verotoxigenic *Escherichia coli*.

** Extended spectrum b-lactamase (ESBL)/AmpC gene-carrying *Escherichia coli*.

Table 1. Priority for public health of biological hazards associated with consumption of meat from bovines, swine, sheep and goats and poultry in the European Union member states (EU MS). Adapted from EFSA scientific opinions on the public health hazards to be covered by inspection of meat (bovine animals, swine, sheep and goats and poultry).

how effectively these official controls are performed may vary and largely depends on the capacity of the veterinary services. However, regardless of their capacity, all veterinary services must adhere to fundamental principles of quality, such as professional judgment, independence, impartiality, integrity and objectivity.

Any effective official veterinary control relies on the strength of the national veterinary services. The World Organisation for Animal Health (OIE) includes a section on quality of veterinary services in the Terrestrial Animal Health Code, where it proposes the evaluation of the performance of veterinary services as a risk analysis tool which may aid countries to formulate policies focusing on animal health and sanitary controls. It is recognised that the strengthening of the services requires both public and private investment and engagement.

Although policies and interventions targeting the control of all the animal diseases are not harmonised in different countries, it is important to have agreed general guidelines which could help to achieve common goals. This is especially relevant when considering trade restrictions and the associated economic impact of an animal disease. One example is foot and mouth disease, a non-zoonotic disease which causes a big impact in food security and economic development. The European Commission for the Control of Foot-and-Mouth Disease (EuFMD) and the Food and Agriculture Organisation of the United Nations (FAO) developed the Progressive Control Pathway for Foot and Mouth Disease (PCP-FMD) in order to reduce disease burden, and in 2012 became the joint FAO-EuFMD-OIE tool for the national (and for some regional) FMD control programme. However, as countries have different priorities, the PCP-FMD does not intend to be a prescriptive document, but provide guidance to countries in favour of reaching key outcomes.

The economic impact of an animal disease is an important driver of policy and decision-making. This impact is not only related to the economic losses for stopping trade and the potential detrimental effect in human health, but also it is due to the cost associated to animal disease control strategies. In some countries the direct cost of official controls is assumed by the government, while others have implemented a cost share approach. The level of participation of each stakeholder in covering the cost of official controls and intervention methods depends on several factors, including ethics. Limited resources highlight the need to prioritise and to decide which disease, what procedure and until what stage is best to control the disease.

Rinderpest is, till now, the only animal disease that has been eradicated worldwide. Although in enzootic areas for rinderpest there was low morbidity and mild clinical signs in affected animals, in the rest of the world morbidity was as high as 100%, while mortality reached up to 90%. The international efforts to eliminate the disease, which included the creation of the OIE in 1924, were driven



Figure 2: Sheep in a livestock auction market. Photo: Rodrigo Nova.

because of the economic devastation and the threat to food security that rinderpest posed. Peste des petits ruminants (PPR) is the second animal disease targeted for eradication. Currently, nearly 80% of small ruminants are kept in Asia and Africa, mostly in pastoralist systems and owned by subsistence farmers. The control and eradication of PPR will contribute not only to improved animal health, but also to the alleviation of poverty (Figure 3). For the global strategy for the control and eradication of PPR to be successful, veterinary services and the controls carried out by them must be effective.

Because of globalisation and the current easy movement of people and goods, including animals and products of animal origin, animal and zoonotic diseases could spread more easily. Thus, more than ever veterinary controls should be effective when fulfilling their role. That implementation of effective veterinary official controls without a doubt brings economic benefits to a country and helps to improve the general health status of animals and humans alike. Though the need to prioritise risks is as essential as including trained veterinarians in the official control teams. The use of tools such as value chain and cost/benefit for risk analysis can help to produce useful data, which could guide decision-makers in how to approach risk management.

In conclusion, as expertise is not widely available, veterinary education institutions have an important



role in preparing professionals who could, later on, carry out official controls. However, it is important to include minimum standards in higher education and to set minimum essential competences, which could guarantee that veterinary professionals are able to perform effectively. Unfortunately, not every country has the capacity to monitor that the standards are fulfilled or has the legal framework to enforce them. Support of and collaboration with other countries through international organisations, national veterinary services and educational institutions will result in global benefits by strengthening official controls, thus preventing risks and reducing the impact of crisis.

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