Abstract

We present a brief overview of the use of beta-agonists in feeding stuff in Portugal in the last two decades.

Introduction

Beta-agonists are used in human and veterinary medicine for specific effects on smooth muscle. When misused at higher doses, they can also act as growth promoters by stimulating the increase of the muscular mass and reducing the adipose tissue. In the EU, Directive 96/22/EC prohibits the use of beta-agonists in food producing animals except for well-defined therapeutic purposes and under strict veterinary control. However some of them are allowed in countries such as Japan, the United States, Canada and several countries in South America. Doses effectively used as repartioning agent are a factor 10 times higher than the recommended therapeutic dose. These compounds act as growth promoting and repartioning agents in many species including cattle, sheep, swine, poultry and man (Witkamp, 1996) [5].

In the 90’s several outbreaks of food poisoning were reported after the consumption of meat contaminated with clenbuterol in Spain, France and Italy. In Portugal there were some well-known cases of human intoxication (four cases of acute food poisoning involving a total of 50 people) after consuming contaminated lamb and bovine meat containing residues of clenbuterol, which were reported some years ago. The period in which these poisonings occurred was between 1998 and 2002 (Barbosa et al., 2005) [1].

The impact on the health and welfare of the animals treated with such high concentration of beta-agonist is poor, nevertheless some reports of known changes in the behavior. Some large companies for food services in the USA agree, this year, to work with its suppliers to eliminate the use of this kind of compounds, hormones and feed additives that it says are harmful to animals, including zilpaterol and ractopamine. The pledges are part of a new set of animal welfare principles that have been developed in collaboration with animal welfare and protection organization the Humane Society of the United States (HSUS) (Searby, L.) [4].

Material and Methods

In order to protect consumers inside the EU, there are official programs, national and from the community. These programs include the survey of animals on farms, in slaughterhouses and at borders, and often serve to support the health inspection of slaughterhouses, essential elements for ensuring the quality of the meat that is consumed. Selection of the most appropriated sample is important. On farms drinking water and feed are the ideal samples for control once beta-agonists demand the oral administration for the repartioning effect. Urine is the most used, especially for control of usage in live animals, but the levels are low within a short time of withdrawal and cleared rapidly from the body. Other no conventional sample is hair.

Organs, namely liver, which accumulate beta-agonists are more suitable for monitoring usage (Boyd et al, 1996) [3]. Other organs, such as lung and eye are very popular samples for research. For the control of veterinary drug residues we generally use two types of methods: screening and confirmatory. The most widely used screening tests are immunoassays, namely ELISA, and by now there are several commercially available kits for a large number of molecules. LC-MS/MS (BVL, 2006) [2], for screening and confirmatory purposes became in the last years a very robust method with high specificity and sensitivity that allows to analyze a large number of compounds (clenbuterol, salbutamol, ractopamine, zilpaterol and many others).
and simultaneously corticosteroids used in several countries as illegal growth promoters in association with beta-agonists.

Results and Discussion

Results from the official controls can be found in EFSA website. Concerning the non biological samples, the number of positive results and the concentration found are much lower than in the previous decade and only clenbuterol and ractopamine were found. Although animal feed have been analyzed, they have been encountered only in animal drinking water. On the other hand, there are currently no cases reported on human health associated with consumption of meat contaminated with beta-agonists in Portugal.

Conclusions

The economic pressure that has led to illegal use of beta-agonists by livestock producers is probably the same that will lead to its disappearance in the food chain.

References


Risk Assessment and risk communication of foodborne pathogens

48. Risk-based approach for food safety applied to pork value chain in Vietnam

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Food-borne disease is a major public health issue in Vietnam. The contamination of popular foods can occur all along the food value chain. It is important to understand how and where food safety issues arise to mitigate and prevent food-borne diseases. Risk-based approach is a tool for managing food safety, however in Vietnam it is rarely applied and the capacity for application is still lacking however risk-based approach it is rarely applied and the capacity for application is still lacking. This paper describes the risk assessment training and research for pork along pig value chain in Vietnam. Risk assessment short courses and training curriculum were developed and taught at universities to strengthen the risk assessment capacity of partners. In parallel and after the training, risk assessment case studies were conducted to assess health risks related to pork consumption in the context of a pig smallholder value chain and pork traded in informal markets. Microbial (Salmonella) in 1275 pork and environmental samples collected at farm, slaughterhouse, and market and consumption level were analyzed. Pork consumption behavior and cross-contamination modalities during pork preparation were assessed. Chemical hazards (antibiotic and heavy metal residues) in 190 pork samples from markets were also analyzed. Results showed that Salmonella contamination in carcass swab in slaughterhouse was 39%, and in the final pork at market 45% with an average concentration of 9 MPN/g was recorded. 50% and 16.7% pooled samples were positive with sulfamethazine and chloramphenicol, with an average residue level of 156µg/kg and 0.54 µg/kg respectively. A quantitative risk modeling is being developed and integrates information on contamination along the pork value chain to characterize the health risk caused by Salmonella. Results of risk modeling will be presented and risk mitigation options discussed.

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