

## 47. Use of beta agonists in feeding stuff in Portugal: an overview

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### 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 betaagonist 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 ratopamine. 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, wich 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

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