REPORT OF THE SCIENTIFIC COMMITTEE FOR ANIMAL NUTRITION ON THE USE OF LASALOCID SODIUM IN FEEDINGSTUFFS FOR CHICKENS

Opinion expressed 14 December 1982

TERMS OF REFERENCE (November 1980)

The Scientific Committee for Animal Nutrition is requested to give an opinion on the following questions :

1. Does the use of the coccidiostat lasalocid sodium in feedingstuffs for chickens, under the conditions authorized (see Background), result in the presence of residues in animal products? If so, what is the nature and the amount of these residues? Could these residues be harmful to the consumer?

2. Could the use of this additive induce the development of resistance in bacteria?

3. Could the excreted products, derived from the additive, be prejudicial to the environment? If so, what is the nature of the risks?

4. In the light of the answers to the above questions, should the conditions of use authorized for this additive be maintained or should they be modified?

BACKGROUND

In accordance with the provisions of Council Directive 70/524/EEC, of 23 November 1970, concerning additives in feedingstuffs (1), as last amended by the thirty-fourth Commission Directive of 4 September 1980 (2), Member States are authorized by way of derogation to use lasalocid sodium under the following conditions set out in Annex II, Section B, of the Directive:

Species of animal : Chickens for fattening.
Minimum and maximum content in complete feedingstuffs : 75-125 ppm (mg/kg).
Other provisions : use prohibited at least five days before slaughter.

OPINION OF THE COMMITTEE

1. In studies with ^{14}C-labelled lasalocid in chicken about 95% of the dose was found in the excreta where three metabolites were identified as hydrolysis breakdown products. The remaining 5% appeared as residues in liver, kidneys, skin, fat and muscle. With the exception of two metabolites in the liver none other has been identified. After oral administration to chickens the highest residue levels were found in the liver when radioactivity measurements were used, but in skin and fat when microbiological assays were employed.

   In chickens fed for three weeks ^{14}C-lasalocid at 75 and 125 mg/kg

(1) OJ No L 270, 14.12.1970, p. 1
(2) OJ No L 251, 24.09.1980, p. 17

feedingstuff, the residues determined by radioactivity measurements were immediately after treatment 4 to 12 mg/kg in the liver and 0.6 to 2.5 mg/kg in other tissues. After a 5-day withdrawal period these residues had decreased to 0.7-1.25 mg/kg in the liver and to $\leq$ 0.13 mg/kg in the other tissues. After 39 days or eight weeks of the same diets, the residues determined by microbiological assay and expressed as lasalocid were of the order of 0.1 mg/kg in liver and kidneys, 0.4 mg/kg in skin and fat and 0.02 mg/kg in muscles immediately after the treatment. After a one-day withdrawal period, traces of residues were detected in skin and fat only. The difference between residue levels obtained by radioactivity measurements and microbiological assay can be explained as a consequence of the metabolism of lasalocid in the liver into non-microbiologically active ^{14}C-labelled compounds.

Lasalocid was investigated in short- and long-term toxicological studies on laboratory animals. The acute oral toxicity for the rat was about 0.1 g/kg b.w. In a 2 1/2 year rat feeding study the no-effect level was 10 mg/kg feedingstuff (about 0.5 mg/kg b.w.). At higher dosages changes in haematology, biochemistry and organ weights were observed. In a 2 year oral study in dogs the no-effect level was 35 mg/kg feedingstuff. A 3 generation reproduction study in the rat lead to the same value. In in vitro test with microorganisms no mutagenic activity could be detected. From the long-term study in rats an ADI for man of 0.005 mg/kg b.w. was established.

In the light of this information, the use of lasalocid under the conditions authorized should not constitute any risks to the consumer.

2. The product is inactive against Gram-negative bacteria, especially E. Coli. In Gram-positive bacteria (Streptococcus and Staphylococcus), occasionally the sensitivity decreased very slightly after exposure to the antibiotic. However, none of the bacterial strains tested showed cross-resistance to antibiotics used in therapeutics, even when a transient resistance to lasalocid sodium developed. The fact that lasalocid is inactive against Gram-negative bacteria means that this product cannot induce the selection of enterobacteria carrying R-factor.

   In the light of this information, it would appear that the use of lasalocid sodium does not induce significant development of bacterial resistance.

3. At dose levels of 75-125 mg/kg of feed, the amount of lasalocid in chicken excreta varies from 6 to 2 mg/kg, depending on the fattening period and the moisture content. In chicken excreta, kept in aerobic conditions at 32°C and 85% humidity, degradation attains 50% in 48 hours and 75% in 15 days. In anaerobic conditions degradation is slight.

   In litters used for several successive batches of fattening chickens treated with lasalocid, the concentration never exceeds 2-6 mg/kg; untreated chickens reared on such litters show no residues of lasalocid in the tissues.

   A number of studies show that lasalocid in the soil (incorporated in chicken excreta or added as such, even in concentrations considerably in excess of those encountered in practice) is rapidly broken down by chemical and microbiological processes; breakdown is complete within 2-3 weeks depending on the type of soil. Lasalocid incorporated in

excreta or in the soil migrates into water where it is broken down : light, heat and alkalinity greatly accelerate degradation, and in aqueous extracts of faecal matter the rate of degradation exceeds 95% in 4 hours. Even at concentrations of 7.5-22.5 g/hectare, equivalent to 1-5 tonnes of excreta per hectare, lasalocid has no phytotoxic effect and does not affect the growth of plants (Zea mays, Hordeum vulgare, Glycine max, Lycopersicon esculatum, Colocynthis citrullus). It has no pesticide effect. It is only slightly toxic towards aquatic organisms (Daphnia magna, Carassius auratus, Lepomis macrochirus). (The no-effect level is 1.0 mg/litre). Concentrations of lasalocid capable of inhibiting methanogenesis are higher than those encountered in chicken excreta. The rapid degradation of lasalocid in the soil, and above all in aqueous extracts of droppings, precludes any activity against nitrifying bacteria in the soil.

In the light of this information, it would appear that the excreted products, derived from the additive, are not prejudicial to the environment.

4. In the light of the available information, the Committee is of the opinion that the use of lasalocid sodium in feedingstuffs for chickens, at use level of 75-125 mg/kg (ppm), should be maintained subject to a withdrawal period of not less than five days before slaughter.

REFERENCES

Dossiers Hoffmann-La Roche.