# COMPATIBILITY OF TIAMULIN WITH MONENSIN AND WITH ANTHELMINTICS IN SWINE

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Cross contamination of animal feed with feed additives and incompatibilities of some additivies has recently led to more extensive investigation, particularly in non target species. Certain antibiotics are contraindicated in some farm species because of toxicity, and an incompatibility exists between monensin and tiamulin and monensin and troleandomycin. Tiamulin, (Dynamutilin, E.R. Squibb & Sons, Inc.), a semisynthetic derivative of the antibiotic pleuromutilin, and monensin are incompatible in poultry. In swine, tiamulin is recommended for oral and parenteral use, whereas monensin is not recommended in swine. Nevertheless, because of the possibility of cross-contamination and errors in feeding, the compatibility of tiamulin and monensin in growing pigs was studied. In addition, the compatibility of tiamulin with the following anthelmintics used in swine, tetramisole, dichlorvos, fenbendazole, parbendazole, piperazine and levamisole was studied. The paremeters of observation were general appearance, body weight and feed consumption.

Materials and Methods. To test the compatibility of tiamulin and monensin in swine 2 tests were conducted. In the first test, 30 pigs average body weight 24 kg were divided in six groups and given no treatment, monensin at 4 mg/kg body weight in feed for 28 days, tiamulin at 200 ppm for 10 days, tiamulin at 15 mg/kg IM for five days and combinations of both compounds. Tiamulin in the feed was given during the last ten days of monensin feeding, whereas tiamulin injection was administered during the last five days of this period. Pigs were observed for 2 weeks following treatment. In a similar test, tiamulin in the drinking water at 0.006% for 5 days was given to a group of six growing pigs fed monensin at 100 ppm. Other groups were given monensin alone or tiamulin alone. Body weights, feed consumption and water consumption were recorded.

To determine compatibility with anthelmintics, 45 pigs with an average body weight of 67 kg, were divided into 15 groups of three pigs each. Two groups acted as controls, whereas the remaining groups were randomly assigned (1 group per treatment) to tiamulin, 200 ppm for ten days, tetramisole in feed at 15 mg/kg body weight (BW), levamisole, 7.5 mg/kg BW by S.C. injection, fenbendazole, 5 mg/kg BW in feed, parbendazole, 20 mg/kg BW in feed, dichlorvos, 40 mg/kg BW in feed and piperazine 110 mg/kg BW in feed, and tiamulin in combination with each anthelmintic. The anthelmintics were given as a single dose on the seventh day of feeding tiamulin.

Results. Pigs given tiamulin 200 ppm (approximately 6 mg/kg BW), monensin in the feed at 4 mg/kg or a combination of both remained in good health throughout the study and no abnormal clinical signs were noted. There was no marked or consistent differences in group mean values which could be associated with treatment and feed consumption was normal during the treatment and post-treatment periods.

In pigs treated with tiamulin at 15 mg/kg by intramuscular injection and given monensin in the diet, no abnormal clinical signs were noted until the end of the treatment period when 3 of the 5 pigs showed clinically abnormal signs consistent with CNS toxicity (ataxia and incoordination, muscular tremors). These signs were marked for up to three days: the pigs recovered thereafter although slight incoordination persisted in 2 animals for up to 10 days. Following the occurrence of clinical signs all the pigs in this group were sacrificied in addition to 2 control animals. Histological examination of brain, spinal cord, heart, liver and kidney did not reveal any changes considered to be of any toxicological significance.

Monensin at 100 ppm, tiamulin at 0.006% in the drinking water or a combination of both (approximately 4 mg/kg of monensin and 11 mg/kg of tiamulin) had no effect on body weights, feed consumption or water consumption. There was no apparent adverse effect of the combination.

Feeding of tiamulin at 200 ppm and then administering the various anthelmintics on day 7 had no adverse effects. Daily observations of general appearance, body weights, feed consumption and body temperatures on days, 0, 7, and 10 revealed no adverse effects of the various combinations.

It is concluded that tiamulin in the feed with the commonly used anthelmintics is safe in pigs. At the levels tested, monensin in the feed and tiamulin by injection were not compatible, although tiamulin in the feed or water with monensin was compatible.

Summary. A series of studies were conducted in pigs to determine the compatibility of tiamulin with commonly used anthelmintics and monensin. Tiamulin in the feed was compatible with simultaneous administration of tetramisole, dichlorvos, fenbendazole, parbendazole, piperazine, levamisole and monensin. Tiamulin in the water was also compatible with simultaneous administration of monensin. Tiamulin at 15 mg/kg by injection and monensin in the diet at approximately 4 mg/kg body weight per day resulted in clinically abnormal signs consistent with CNS toxicity.

Selected References. Drake, J.N., Vet. Rec. 1981, 108: 219; Miller, D.J.S., Vet. Rec. 1981, 108:317; Folkerts, T.M., Monensin in Current Veterinary Therapy-Food Animal Practice. 1981, W.B. Saunders Co. P. 400; Pott, J.M., and Skov, B., Vet. Rec. 1981 109: 545; Stansfield, D.G., and Lamont M.H., Vet. Rec. 1981, 109: 545.