AN EVALUATION OF APRAMYCIN AS AN IN-FEED MEDICATION FOR THE TREATMENT OF POST-WEANING COLIBACILLOSIS IN PIGS

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ABSTRACT


Apramycin, a new aminocyclitol antibiotic produced by a strain of Streptomyces tenebrarius, has been evaluated as a treatment of colibacillosis in post-weaning pigs. Results are reported from 3 trials in Greece, involving 222 animals. The drug was administered in the feed at 75 ppm or 100 ppm for 21 days. Apramycin at both levels controlled diarrhoea and sickness. Mortality was significantly reduced at 100 ppm. The average daily gain of the treated animals over the three week treatment period was improved by 67% (P<0.001) for the 100 ppm group and by 42% (P<0.01) for the 75 ppm group in comparison with the untreated controls. During the same period the feed conversion ratio was improved by 40% (P<0.001) in the 100 ppm apramycin group and by 26% (P<0.05) in the 75 ppm group as compared to the untreated controls. Average daily feed intake was significantly greater in the treated groups of animals than in the untreated groups.

INTRODUCTION

Apramycin, a new aminocyclitol antibiotic produced by a strain of Streptomyces tenebrarius, has been evaluated as a treatment of colibacillosis in post-weaning pigs. Results are reported from 3 trials in Greece, involving 222 animals. The drug was administered in the feed at 75 ppm or 100 ppm for 21 days. Apramycin at both levels controlled diarrhoea and sickness. Mortality was significantly reduced at 100 ppm. The average daily gain of the treated animals over the three week treatment period was improved by 67% (P<0.001) for the 100 ppm group and by 42% (P<0.01) for the 75 ppm group in comparison with the untreated controls. During the same period the feed conversion ratio was improved by 40% (P<0.001) in the 100 ppm apramycin group and by 26% (P<0.05) in the 75 ppm group as compared to the untreated controls. Average daily feed intake was significantly greater in the treated groups of animals than in the untreated groups.

Apramycin is a new aminocyclitol antibiotic produced by a strain of Streptomyces tenebrarius. Its spectrum of antibacterial activity includes Salmonella spp., Escherichia coli, Klebsiella spp. and Staphylococcus spp. (Ose et al., 1976; Ryden and Moore, 1977; Walton, 1978). Apramycin as an oral and an injectable preparation has been evaluated for the treatment of intestinal bacterial infections in animals (Pankhurst et al., 1975; Gorham et al., 1976; Stoforos et al., 1978a,b). The purpose
of the present study was to evaluate the efficacy of apramycin in the control of colibacillosis in weaned pigs under Greek conditions, at levels of 75 ppm and 100 ppm in the feed for 3 weeks.

MATERIALS AND METHODS

A total of three trials was conducted on the same farm.

In the trials, 4-week old Landrace X Large White pigs, bred on the farm, were used. Out of 36 naturally infected litters, 222 pigs showing signs of diarrhea were selected and allocated to treatments and pens taking into consideration individual weight, litter of origin and sex.

Three treatments were used: untreated controls, apramycin 75 ppm and apramycin 100 ppm in the ration. Each group of treatments contained 7 replicates with 10-11 pigs per pen of mixed sexes.

All swine were given a commercial pig starter ration, in mash form, containing 24.8% protein, floor fed ad libitum throughout the trial period.

Treatments were started on day 0 of the trials and continued for 21 days. From day 21 to day 28, the end of the trials, blank feeds were substituted. No other antibacterial therapy was given during the trials.

For one week pre-weaning and two weeks post-weaning, all the pigs were given a water supplementation of the following composition: dextrose 200 g, sodium bicarbonate 2 g and vitamin C 0.5 g per 10 litres of water (Elezoglou et al., 1978).

All pigs were examined clinically once daily and the disease status and severity of diarrhea present were each allocated a score on a pen basis, as shown in Table I. Daily clinical examination was continued for 28 days following initiation of treatment. Each pig was weighed on days 0, 7, 14, 21 and 28 and on the day of removal from the trial in the event of death. Feed consumption on a pen basis was recorded weekly, on days 7, 14, 21 and 28. Rectal swabs taken on days 0, 7 and 21 from one identified animal per pen were submitted to a laboratory for bacterial isolation. Dead pigs were subjected to post-mortem examination and bacterial isolation procedures. Prior to commencing treatment, 3 sick pigs were sacrificed and swabs and tissues sent to a laboratory to establish a diagnosis of colibacillosis.

All data were subjected to an analysis of variance with the pen as the experimental unit, isolating the terms for replicates and treatments. Feed conversion ratio values were analysed as their reciprocals, to render the variances more homogeneous. The differences between replicates were generally not significant except that a rather low level of diarrhea and sickness was seen in the first trial. The standard errors of the differences between treatment means (S.E.D.) were calculated from the residual variances and used to assess significance by the t-test.