ANTIBIOTIC FEED SUPPLEMENT (AUREOMYCIN) FOR DAIRY
CALVES

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It is now fairly well established that antibiotics *per se* and feed supplements containing antibiotics stimulate the growth of chickens (14, 15) and pigs (6, 9).

In regard to ruminants, several investigations (3, 4, 5, 8, 11) on feeding antibiotics recently have been reported. Evidence by Rusoff (11) indicated that small amounts of aureomycin supplement (2.27 g. aureomycin per 100 lb. feed) in a grain ration stimulated the growth of 3.5-mo.-old dairy calves during an 8-wk. period. Bartley *et al.* (3) have reported that aureomycin increased the growth of young calves up to 7 wk. of age by preventing scours. The calves were fed a normal diet supplemented daily with an aureomycin supplement (approximately 15 mg. aureomycin per 100 lb. body weight) by capsule. Loosli and Wallace (8) also have demonstrated that aureomycin produced a slight increase in growth rate in young calves up to 8 wk. of age and a decrease in the incidence and severity of diarrhea. The calves, 10 to 14 days of age, were fed various milk substitutes to which was added a 2.8 per cent level of aureomycin supplement, or 0.5 g. of crystalline aureomycin per 100 lb. of dry milk substitute. The animals also received grain and hay.

Detrimental effects of feeding aureomycin have been reported by Colby *et al.* (5) who have evidence that the antibiotics, aureomycin, penicillin and streptomycin (100 mg. levels daily), or aureomycin supplement (0.5 per cent level) caused lambs to go off feed, lose weight and have diarrhea. Bell *et al.* (4) also have reported adverse effects of feeding aureomycin (0.6 g. daily) to steers on a balance trial involving urea. The animals showed marked anorexia and diarrhea within 48 to 72 hr. Mild symptoms were observed when 0.2 g. aureomycin was fed daily. On the basis of the last two reports, it was suggested that rumen function was inhibited and, therefore, the use of antibiotics or antibiotic feed supplements in ruminant feeding has not been advocated. The present study reports the beneficial effects of an aureomycin supplement on ruminating calves over a 20-wk. period.

EXPERIMENTAL

Two equal groups of Jersey calves, each containing five males 14 wk. of age, were used. Both groups of calves had been weaned from milk at 28 days of age and had received a basal all-plant protein calf starter. In addition, one of the groups had received a vitamin B₁₂ feed supplement, supplying 0.5 mg. vitamin B₁₂ per 100 lb. feed, up to 14 wk. of age. The supplementation of vitamin B₁₂ was without effect on the growth of calves (13). The basal group was continued on a simple grain ration consisting of one part cottonseed meal, three parts yellow

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corn meal, 2 per cent bonemeal and 1 per cent common salt. The other group was fed this basal ration plus 2 per cent of an aureomycin supplement (Aurofac*). The calves in both groups were fed 4 lb. of grain daily for the first 4 wk., 6 lb. daily for the next 4 wk. and 8 lb. daily thereafter for the remainder of the trial. On the basis of the amount of grain fed, the calves in the aureomycin group were receiving from 90 to 181 mg. of aureomycin daily. All animals were allowed limited pasture and some medium-quality lespedeza hay. The experiment was continued for 20 wk.

RESULTS AND DISCUSSION

The average daily gain per calf per day for each group at intervals of 2 wk. is shown in table 1. The calves in the aureomycin group showed an increase in

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| Group | No. of calves (Jerseys) | Weeks of age |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Basal | 5 | 0.79 | 0.92 | 1.04 | 1.10 | 1.42 | 1.40 | 1.54 | 1.70 | 1.68 | 1.69 | 1.66 |
| Aureomycin (Basal + 2% Aurofac) | 5 | 0.78a | 1.48 | 1.42 | 1.44 | 1.53 | 1.50 | 1.59 | 1.73 | 1.61 | 1.65 | 1.65 |

a Results with vitamin B12 supplement.
b Supplied through the courtesy of E. L. R. Stokstad, Lederle Lab., American Cyanamid Co., Pearl River, N. Y.

weight over those in the basal group during the first 6 wk. on experiment (20 wk. of age) by approximately 60, 36 and 30 per cent, respectively, for the 2-wk. periods. The average daily gain at this time was 1.44 lb. for the aureomycin-fed calves and 1.10 lb. for the control calves. This difference was found to be significant at P = 0.05. After 8 wk. this increase in growth rate was approximately 8 per cent and declined gradually thereafter. After 20 wk. (34 wk. of age), the average daily gain per calf per day for both groups was similar, being 1.65 and 1.66 lb., respectively. Apparently, the stimulating effect of aureomycin on the growth of ruminating calves 14 wk. of age is only of short duration.

After 4 wk. on experiment, the calves receiving aureomycin had a smooth hair coat and sleek solid muscular appearance, while the calves in the basal group were rougher in appearance and had a larger middle. The better appearance of the antibiotic-fed calves persisted throughout the experimental period. At no time was there any evidence of anorexia or diarrhea.

While only a few animals were used in this investigation, the consistent beneficial response of the calves to the antibiotic, especially during the first 6 wk. of the 20-wk. period, is of significance. It is conceivable that the beneficial effect of aureomycin on the experimental animals was due to a synergistic action with extra-stored vitamin B12, for these animals previously had received vitamin B12 supplementation during their first 14 wk. of life. Since the present experiment

* Formerly known as Lederle's A.P.F. no. 5; contained 2.5 mg. of aureomycin per g.
was completed, Rusoff and Davis (12) have obtained data which show that supplemental vitamin B₁₂ is not necessary with aureomycin in order to obtain a growth stimulation in young calves. These workers fed calves crystalline aureomycin from 2 to 16 wk. of age, using a basal all plant-protein calf starter. Evidence is available that ruminants synthesize vitamin B₁₂ by rumen or intestinal symbiosis (1, 7, 13) and, therefore, it is suggested that perhaps additional supplementation of vitamin B₁₂ along with an antibiotic for calves might give a still greater growth response than the antibiotic per se.

The detrimental effect of antibiotics on lambs (5) may be due to a species difference, while the effect of aureomycin on steers (4) may be due to the maturity of the ruminants, the daily high level (600 mg.) of antibiotic fed, or to the type of ration used, since these workers were testing the digestibility of a ration containing urea. Perhaps the percentage of protein in the ration is involved.

Bell et al. (4) also reported that aureomycin decreased the digestibility of crude fiber by 50 per cent and suggested that the cellulytic microorganisms in the gastro-intestinal tract were affected. A bacteriological study of the rumen contents of young calves receiving aureomycin and no aureomycin was made by Alford and Rusoff (2). This investigation has failed to reveal any effect of aureomycin on the morphological types of microorganisms normally present in the rumen (10). These data suggest that some of the effects of aureomycin on dairy calves might be due to its action on the intestinal microflora. Considerable additional evidence should be obtained to verify such a theory.

**SUMMARY**

An aureomycin supplement (Aurofac) fed at a 2 per cent level in a grain ration stimulated the growth of ruminating dairy calves (14 wk. old) by approximately 35 per cent for the first 6 wk., and resulted in better appearance and condition of the animals. This increased rate of growth declined thereafter and after 20 wk. of feeding the antibiotic supplement, the calves showed gains similar to those in the control group. The feeding of aureomycin produced no detrimental effects.

**REFERENCES**


