

3. Berberine Sulfate was the dye of preference although Auramine-O and Rhodamine-B were gauged equally as good.

4. Twelve strains of bacteria, one protozoa, and one fungi were used in testing this procedure.

5. All 14 organisms gave excellent fluo-

rescent reaction to 3 dyes and 11 strains gave excellent results to a fourth dye.

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### Response of the Pig to APF, B<sub>12</sub> and B<sub>12b</sub>. (17844)

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Using a corn-peanut meal ration Cunha *et al.*(1) showed that an animal protein factor supplement (Lederle) and crude concentrates (charcoal and fuller's earth) of B<sub>12</sub> differed in their effect on the pig. The objective of this experiment was to determine what the effect of a relatively pure concentrate of B<sub>12</sub> and B<sub>12b</sub> is when given orally or when injected and to determine whether or not the effect is different from that of APF.

**Materials and methods.** The control ration used consisted of corn, peanut meal, minerals, and the known vitamins which the pig has been shown to need as previously described by Cunha *et al.*(1) Four 8-week-old pigs, equalized with respect to sex, condition, weight, thriftiness and previous dietary history were allotted to each lot. The feeding period was for 40 days. The pigs were housed and fed on concrete floors which were washed once daily.

**Results and comments.** The data obtained in this trial (Table I) show that vitamin B<sub>12</sub> (a mixture of B<sub>12</sub> and B<sub>12b</sub>), fed either orally or injected did not significantly affect the rate of growth when added to the corn-peanut meal basal ration for a feeding period of 40 days. This confirms earlier data by Cunha *et al.*(1) when concentrates (charcoal and fuller's earth) of B<sub>12</sub> were fed orally. The

pigs injected with B<sub>12</sub> in lot 2 did not gain as well as the pigs on the basal ration. The pigs in lot 3, fed APF and injected with B<sub>12</sub>, did not gain as rapidly as the pigs fed APF only in lot 5. Thus, in the 2 lots of pigs, where B<sub>12</sub> was injected, it seemed to decrease the rate of gain about 0.1 lb. daily.

A diarrhea was observed during the first 2 weeks of the trial in the pigs on the basal ration and periodically throughout the trial in the pigs in lots 2 and 4 where vitamin B<sub>12</sub> was used. No diarrhea was observed in lots 3 and 5 where APF was added to the ration. Thus, these and other observations obtained with this basal ration at this Station, show that APF contains some factor or factors which prevents a diarrhea (semi-liquid yellowish feces) in pigs. The APF supplement (lot No. 8108-109 prepared by drying the mycelium from deep aerobic cultures of *Streptomyces aureofaciens* together with some filter aid) was found to contain 3 mg of aureomycin per gram by microbiological assay at Lederle Laboratories. Jukes *et al.*(2) and Cunha *et al.*(3) showed that either aureomycin or APF prevented diarrhea with

1. Cunha, T. J., Burnside, J. E., Buschman, D. M., Glasscock, R. S., Pearson, A. M. and Shealy, A. L., *Arch. Biochem.*, 1949, v23, 324.

2. Jukes, T. H., Stokstad, E. L. R., Taylor, R. R., Cunha, T. J., Edwards, H. M., and Meadows, G. B., *Arch. Biochem.*, 1950, in press.

3. Cunha, T. J., Edwards, H. M., Meadows, G. B., Sewell, R. F., Shawver, C. B., Pearson, A. M., and Glasscock, R. S., *Fla. Agr. Exp. Sta.*, unpublished data. 1950.

TABLE I.  
Effect of APF, B<sub>12</sub>, and B<sub>12b</sub> on the Pig.

| Lot No. | Ration fed                    | Avg starting wt, lb | Avg final wt, lb | Avg daily gain, lb |
|---------|-------------------------------|---------------------|------------------|--------------------|
| 1       | Basal                         | 19.1                | 49.1             | 0.75               |
| 2       | " + B <sub>12</sub> injected* | 19.4                | 45.8             | 0.66               |
| 3       | " + " " " + APF†              | 20.0                | 66.0             | 1.15               |
| 4       | " + " " orally‡               | 20.1                | 49.3             | 0.73               |
| 5       | " + APF†                      | 18.9                | 68.9             | 1.25               |

\* B<sub>12</sub> conc. which contained approximately equal parts of a relatively pure mixture of vit. B<sub>12</sub> and B<sub>12b</sub> (had at least 10 mg of B<sub>12</sub> activity per gram of solids) obtained from Dr. T. H. Jukes, Lederle Laboratories, Pearl River, N.Y. B<sub>12</sub> mixture was inj. peritoneally at the rate of 5  $\gamma$  per kilo body wt once weekly.

† Lederle APF supplement (lot No. 8108-109) fed at a level of 1000 g per 100 lb of feed.

‡ The B<sub>12</sub> and B<sub>12b</sub> mixture was added to the feed at a level of 20  $\gamma$  per lb of feed.

pigs fed a ration similar to that used in lots 2 and 4. Since APF contains aureomycin, and the aureomycin alone prevents the diarrhea, it is probable that aureomycin itself is responsible for preventing the diarrhea obtained with the pigs in this trial. The pigs fed APF had much smoother hair coats and showed more bloom than the pigs in the other lots where APF was not included.

The pigs fed APF (lots 3 and 5) gained at a considerably faster rate than the pigs fed the basal ration with or without B<sub>12</sub> and B<sub>12b</sub>. These data show that APF contains a factor(s) other than B<sub>12</sub> or B<sub>12b</sub> which is of importance for the pig. Jukes *et al.*(2) showed that aureomycin was of considerable benefit in increasing the rate of gain

of pigs when added to a corn-peanut meal ration similar to that used in this trial. Therefore, aureomycin accounted for at least a part of the growth promoting activity of the APF used in this trial since it contained aureomycin.

*Summary.* A mixture of B<sub>12</sub> and B<sub>12b</sub> was of no benefit for growth when administered by injection or orally to the pig during a 40-day period under the conditions of this experiment. APF prevented a diarrhea which occurred periodically with the other pigs on experiment. APF fed pigs exhibited a smoother hair coat and more bloom. Further evidence was obtained to show that APF contains a factor(s) other than B<sub>12</sub> or B<sub>12b</sub>.

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### Agglutination of Mammalian Erythrocytes by Newcastle Disease Virus.\* (17845)

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#### The ability of Newcastle disease virus

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(NDV) to cause the agglutination of mammalian erythrocytes was studied as part of the problem of characterizing strains of the virus. Burnet(1), Clark and Nagler(2), Brandly *et al.*(3), and Chu(4) had reported

1. Burnet, F. M., *Aust. J. Exp. Biol. and Med. Sci.*, 1942, v20, 81.

2. Clark, Ellen and Nagler, F. P. O., *Aust. J. Exp. Biol. and Med. Sci.*, 1943, v21, 103.