

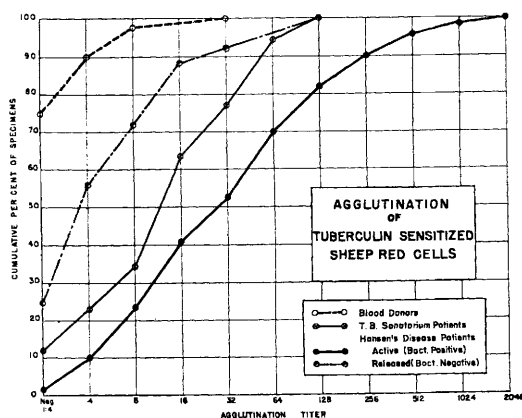


FIG. 1.

whose etiological agent still defies cultivation.

It seems evident that *Mycobacterium tuberculosis* and *Mycobacterium leprae* possess common antigens which stimulate production of common agglutinins in human sera. This does not necessarily indicate a corresponding immunological response. However, the possibility that such a relationship may exist (it does, for example, with respect to various strains of *Salmonella*, as indicated by Longfellow and Luipold(3) and Levine *et al.*(4) raises an intriguing conjecture as to the efficacy of B.C.G. vaccination of children of Hansen's disease patients as a protective

3. Longfellow, D., and Luipold, G. F., *Am. J. Hyg.*, 1943, v38, 139.

4. Levine, M., Enright, J. R., Ching, G., and Tanimoto, R., *Hawaii Med. J.*, 1950, v9, 149.

measure.

On the basis of observations that B.C.G. vaccination induces a positive lepromin test, Chaussinand(5) suggests that it would be of interest to determine whether a preventive action against leprosy is also produced. The data presented, herein, on the serological response of Hansen's disease patients to antigens in tuberculin, serve to augment the view that observations on the heterologous immunological effects of B.C.G. vaccination, with particular reference to Hansen's disease, are worthy of careful consideration.

Summary. The hemagglutination titers of active, bacteriologically positive, cases of Hansen's disease were significantly higher than those of arrested, bacteriologically negative, cases of this disease, and frequently much higher than those encountered in the active cases of tuberculosis examined. The immunological response against antigenic components of the tubercle bacillus elicited by infection with Hansen's disease appears to be very marked and distinct. The inability to grow *Mycobacterium leprae* has naturally hampered serological studies of Hansen's disease. The hemagglutination technic of Middlebrook and Dubos provides a laboratory tool which may be very useful in future studies of this entity.

5. Chaussinand, R., *Int. J. Leprosy*, 1950, v18, 79.

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Effect of APF in Supplying Multiple Factors for the Pig.* (18428)

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(Introduced by Paul B. Pearson.)

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Using a corn-peanut meal ration Cunha *et al.*(1) showed that APF (Lederle) and B₁₂

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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.

were different. This difference was later found by Jukes *et al.*(2) to be at least partially caused by the presence of aureomycin in the APF (Lederle). The purpose of the

2. Jukes, T. H., Stokstad, E. L. R., Taylor, R. R., Cunha, T. J., Edwards, H. M., and Meadows, G. B., *Arch. Biochem.*, 1950, v26, 324.

TABLE I. Data on the Effects of Vitamin B₁₂ and Aureomycin Mash Concentrate, With or Without Alkali Treatment, on Growth of Pigs Fed a Corn-Peanut Meal Diet.

Group No.	Supplement	Exp. 1		Exp. 2	
		Avg start-ing wt, lb.	Avg daily gain, lb.	Avg start-ing wt, lb.	Avg daily gain, lb.
1	0	49.5	0.79	30.1	0.98
2	Vit. B ₁₂ *	47.7	1.18	29.9	1.27
3	Alkali-treated aureomycin mash concentrate†	48.1	1.40	29.1	1.41
4	Vit. B ₁₂ + alkali-treated aureomycin mash concentrate†	47.4	1.23	29.1	1.43
5	Vit. B ₁₂ + alkali-treated aureomycin mash concentrate, high level‡			29.5	1.48
6	Aureomycin mash concentrate§	48.0	1.72	28.0	1.50

* B₁₂ concentrate which contained approximately equal parts of vit. B₁₂ and B_{12b} obtained from Dr. T. H. Jukes, Lederle Laboratories, Pearl River, N. Y. The B₁₂ was mixed in the feed at a level of 44 µg per kilo of diet.

† The liquid alkali-treated concentrate was fed at a level of 23 ml per kilo of diet in Exp. 1, derived from 30 ml of untreated concentrate, and 33 ml in Exp. 2, derived from 33 ml of untreated concentrate. The treatment with alkali consisted of steaming for 30 min. in 1.0 N NaOH. The alkali-treated concentrates contained 30% to 35% NaCl which was produced by neutralization of the sodium hydroxide used in the treatment, so that NaCl was added to the other diets to bring the level up to the total NaCl in lot 4.

‡ 60 ml per kilo of diet.

§ Prepared by concentrating aureomycin mash and fed at a level of 30 ml per kilo of diet in Exp. 1 and 33 ml in Exp. 2.

experiments reported herein was to study the multiple nature of the growth stimulating property of the Lederle APF.

Materials and methods. The control ration used in these experiments consisted of corn, peanut meal, minerals and vitamins as previously described by Cunha *et al.* (1) except that a level of 0.53% of a salt-trace mineral mixture was used instead of 0.5% salt. This mixture consisted of iodized salt 50 lb., manganese sulfate 800 g, ferrous sulfate 398 g, copper sulfate 125 g, and cobalt carbonate 10 g. Four Duroc pigs were used in each lot in both experiments. Exp. 1 was conducted for 59 days and Exp. 2 for 52 days. The pigs were fed on concrete floors which were washed once daily. Three of the 4 pigs used in each lot in Exp. 1 were 14 weeks old and had been depleted on the basal ration for 6 weeks before being started on experiment. The fourth pig in each lot in Exp. 1 was 11 weeks old and had been depleted for 3 weeks on the basal ration before being started on experiment. The pigs used in Exp. 2 were 67 days old and had been depleted for 11 days on the basal ration before being started on experiment.

Results and comments. The data obtained in Exp. 1 and 2 (Table I) show that vit. B₁₂

was of benefit for pigs fed the corn-peanut meal basal ration, when the pigs had been previously depleted. The pigs in Exp. 1 which had been depleted longer gave the greater response to vit. B₁₂. Previous data by Cunha *et al.* (1,3) and Burnside *et al.* (4) have shown that weanling pigs (8 weeks old and not depleted) have responded very little, if at all, to B₁₂ on a corn-peanut meal ration.

Treatment of aureomycin mash with NaOH, as described, was found (5,6) to destroy vit. B₁₂ completely and to destroy 97% of the inhibitory effect of aureomycin against *Staphylococcus aureus*, but the material retained antibiotic activity against various other microorganisms. The data obtained in the present investigation indicate that the alkali-treated material contained a factor or

3. Cunha, T. J., Hopper, H. M., Burnside, J. E., Pearson, A. M., Glasscock, R. S., and Shealy, A. L., *Arch. Biochem.*, 1949, v23, 510.

4. Burnside, J. E., Cunha, T. J., Edwards, H. M., Meadows, G. B., LaMar, G. A., Pearson, A. M., and Glasscock, R. S., *Proc. Soc. Exp. Biol. and Med.*, 1950, v74, 173.

5. Jukes, T. H. Personal communication, 1950.

6. Stokstad, E. L. R., and Jukes, T. H., *Proc. Soc. Exp. Biol. and Med.*, 1950, v73, 523.

factors which increased the rate of growth of pigs. The same increase was observed with or without the addition of vit. B₁₂ which may indicate that the factor or factors in the alkali-treated material have a sparing effect upon vit. B₁₂. Whether or not crystalline aureomycin would have this sparing effect was not determined.

Summary. The data obtained show that B₁₂ is beneficial for pigs which were previously depleted on a corn-peanut meal ration. They also show that alkali-treated APF contains a factor or factors which promote growth of pigs and which may have a sparing effect upon B₁₂ needs of the pig.

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Biochemical Studies on the Iguana. (18429)

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Although the iguana is one of the most common reptiles of tropical America, very little is known of the biochemical nature of these animals. Two species of Iguanidae were obtained from a biological supply house; 7 specimens were "black iguanas," *Ctenosaura acanthura*, from 80-93.5 cm and weighing 830-990 g, and 9 were "common iguanas," *Iguana iguana rhinolopha*, ranging from 111.5-148 cm and weighing 900-1910 g. The common iguana is easy to handle and harmless whereas the black iguana is more active and has to be handled with some caution because of attempts to bite, or to scratch with its sharp hind claws. Both species subsisted on a diet of cabbage.

The analyses reported here were done in August and September. Blood was obtained by cardiac puncture using a No. 19 gauge needle. Best results were obtained by holding the iguana on his back and inserting the needle in an intercostal space on either side of the thorax 1-2 cm caudal to the front limbs. Although some animals received as many as 10 cardiac punctures only 2 died as a result of this procedure. Urine was obtained by inserting a catheter along ventral wall of cloaca. The analytical methods employed were the same as those reported for the alligator studies(1,2), except for plasma magnesium content which was done by the method of Denis(3).

Results. Table I presents a summary of the general blood studies. The oval nucleated erythrocytes are of large size, the mean corpuscular volume (M.C.V.) for the black iguana being 338 μ^3 and for the common iguana 298 μ^3 . In comparison, the alligator corpuscles are larger(1), having an M.C.V. of 472 μ^3 . Table II reveals a number of differences between the two species of lizards in fasting blood and plasma CO₂, chloride, and pH values. Although the CO₂ and chloride contents are different for the two the sums of the anions are about the same. The lower plasma CO₂ of the black iguana is in keeping with the lower blood pH. The differences between the two in the plasma cations are probably not significant. Both species have plasma phosphorus concentrations which are considerably higher than those of the alligator.

The results of the urine analyses of the common iguana are summarized in Table III. In contrast to the alligator the pH of the urine is always more acid than the blood of the same animal and only 6 of the 36 determinations were above pH 7. There was only an occasional trace of chloride present. The values obtained for uric acid, the chief nitrog-

1. Coulson, R. A., Hernandez, T., and Brazda, F. G., *Proc. Soc. Exp. Biol. and Med.*, 1950, v73, 203.

2. Coulson, R. A., Hernandez, T., and Dessauer, H. C., *Proc. Soc. Exp. Biol. and Med.*, 1950, v74, 866.

3. Denis, W., *J. Biol. Chem.*, 1922, v52, 411.