

tested in absorbed serums for single factors f, m, p, q, s, t, and u it was flocculated vigorously by m and t serums but was unaffected by the remainder. Agglutinating serum was then prepared from *S. pensacola*. Results of pertinent agglutination and agglutinin absorption tests are given in Table I. The tests not only demonstrated the close relationships existing among *S. californica*, *S. oranienburg*, and *S. pensacola* but they also emphasized the complicated mosaic of antigens present in *S. enteritidis* and related forms. It was not surprising that *S. pensacola* possessed a strong specific factor since the complexity of the antigens represented by the symbol t is well known.^{1,2,3,4} Inasmuch as *S. pensacola* is very closely related to *S. oranienburg* and *S. californica*, is agglutinated by serums for factors m and t and has definite relationships to the remainder of the *S. enteritidis* group, it

is proposed to designate the type by the formula IX,XII:g,m,t... For diagnostic purposes it is not necessary to introduce a new symbol to designate the specific antigen of the culture and until such time as that becomes necessary it seems undesirable to further complicate the diagnostic schema by the introduction of new symbols.

Summary. A new Salmonella type isolated from gastro-enteritis in man was described. It was called *S. pensacola* and was assigned the formula IX,XII:g,m,t...

¹ Kauffmann, F., *Z. f. Hyg.*, 1937, **120**, 177.

² Rauss, K., *Z. f. Immunitätsf.*, 1939, **95**, 489.

³ Hormaeche, E., Peluffo, C. A., and Salsamendi, R., *Arch. Urug. de Med., Cir. y Espec.*, 1938, **12**, 377.

⁴ Edwards, P. R., Bruner, D. W., and Hinshaw, W. R., *J. Inf. Dis.*, 1940, **66**, 127.

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Effect of Feeding Calcium Arabonate in Diet of Rats for Successive Generations.

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In former studies with carbohydrates, various sugar alcohols were fed to rats for long periods of time.¹ These substances failed to affect deleteriously the rate of growth in 3 successive generations of rats. Recently calcium arabonate has been suggested as a dietary supplement to provide additional calcium in the diet. As such a use would indicate rather large doses of this compound it was deemed advisable to conduct similar long-term feeding experiments with rats.

Material and Methods. Calcium arabonate is a white crystalline powder, 2% soluble in water at 20°. The compound is obtained readily in a pure form from intermediates used in the synthesis of riboflavin. In the form of its normal salt crystallized with 5 molecules

of water calcium arabonate possesses a specific rotation of $[\alpha]_D^{25} -3.0^\circ$ in 2% water solution.

Fifteen young male and 15 young female rats were selected for this study. The average weight of each group was 106 g at the beginning of the experiment. Five percent calcium arabonate was mixed intimately with the food of each group of animals. A balanced diet of purina chow fortified with additional vitamins served as the basic diet. On the 24th day one male and one female were placed in each of 15 cages. At periods of time thereafter male animals were sacrificed for histologic examination of the important viscera. This experimental plan was followed with 2nd and 3rd generation rats. A summary of the data obtained is illustrated in the form of growth curves compared with a group of untreated animals from the stock colony of the laboratory (Fig. 1).

¹ Ellis, F. W., Carr, C. J., Wiegand, E. J., Krantz, J. C., Jr., *Proc. Soc. Exp. Biol. and Med.*, 1943, **52**, 260.

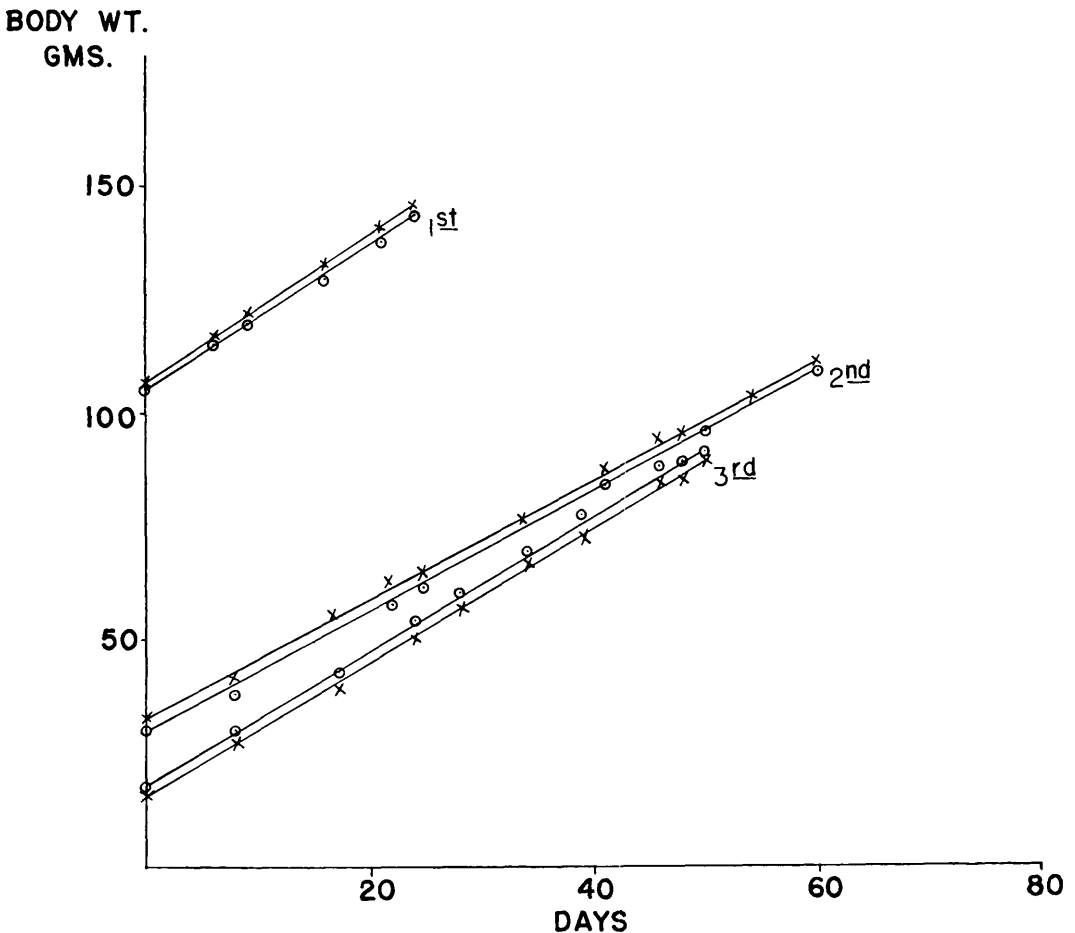


FIG. 1.

Growth curves of first, second and third generation rats fed 5% calcium arabonate. O = experimental animals. X = littermate controls. Days fed calcium arabonate.

First Generation Rats. These rats produced 70 young in 50 days. Throughout this period the animals appeared in a good nutritional state. After 74 days breeding was discontinued but the animals continued to receive the calcium salt in their food. At the termination of the experiment these animals were sacrificed and the organs subjected to examination microscopically.

Second Generation Rats. Twenty-four animals were weaned at the age of 21 days and started on the experimental feeding. A similar group comprised of the control animals did not receive the calcium arabonate in their food. At this time the males and females were separated. At the completion of the growth curve experiment 8 pairs of animals

were mated. The remainder of the animals continued to receive the calcium salt in their food. All of these rats remained in an excellent nutritional state. From the animals that were mated 84 offspring were produced.

Third Generation Rats. A group of offspring was selected at the age of 21 days and fed the calcium salt in their food. A similar group comprised the control animals. The male and female animals were kept separate and a growth curve was plotted for each group. When these rats had attained a body weight of 100 g the experiment was terminated.

Clotting Time. The influence of feeding calcium arabonate in the food of rats was further studied by determining the clotting time of blood of animals selected at random

before and after the experimental period. The clotting time of blood was not significantly altered.

Histologic Studies of Viscera. Twenty-three animals in all were autopsied and sections were prepared from the brain, heart, liver, and kidney for microscopic examination. Grossly no pathologic signs were observed.

Microscopic sections from the first generation animals appeared normal in character. The liver of some animals displayed a granularity of cytoplasm that was thought to be of little significance in connection with these experiments. Two animals in this group each having consumed 107 g of calcium arabonate in their food over a period of 215 days, were

autopsied. No pathological lesions were observed grossly or microscopically in these animals. Male and female animals from subsequent generations failed to demonstrate signs of pathologic changes.

Conclusions. The feeding of 5% calcium arabonate in the diet of the white rat for 3 generations does not significantly alter the growth pattern or fecundity. No significant pathological lesions were observed in the brain, heart, liver, or kidney of these animals. The blood clotting time was not influenced.

The calcium arabonate used in this investigation was kindly supplied by the Hoffmann LaRoche Co., Inc., of Nutley, N.J.

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Experimental Atherosclerosis. VII. Effect of Vitamin E.

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Dam and Kelman¹ showed that vitamin E exerts an effect on the plasma lipids of the vitamin E-deficient chick similar to that of lipocaic. Since considerable lipotropic activity was ascribed to this vitamin, studies were initiated to determine the effect of alpha-tocopherol on experimental atherosclerosis in rabbits. During the course of these experiments, Dam² published his work on cholesterol-fed rabbits and showed that vitamin E, fed as 10 mg% *d,l*-alpha-tocopherol acetate in the basal diet, failed to modify the deposition of cholesterol in the aorta of rabbits fed a diet of ground oats and carrots plus 1% cholesterol.

In the present studies, 22 female rabbits, 3 to 5 months old, were used. Each was fed a basal diet of Ralston Purina rabbit chow daily. Ten of these served as controls; 4 received 100 mg of *d,l*-alpha-tocopherol in olive oil (1 ml) intramuscularly 3 times weekly

for 12 weeks and 6 one gram of cholesterol added to chow 3 times weekly for the same time. Twelve rabbits received both the tocopherol (in olive or sesame oil) and cholesterol.

The whole blood cholesterol was determined at regular intervals by a modified Bloor method.³ At the end of the experimental period (12 weeks), the rabbits were sacrificed. The procedure used for killing the animal, removing the aorta and determining its cholesterol content has been described elsewhere.⁴ An alcohol-ether extract of the wet liver was also analyzed for cholesterol by Bloor's procedure.³

Results and Comment. Table I indicates that the parenteral administration of vitamin E augments appreciably the deposition of cholesterol in the aorta of cholesterol-fed rabbits. These results are at variance with those recently published by Dam² who did not ob-

¹ Dam, H., and Kelman, E. M., *Science*, 1942, **96**, 430.

² Dam, H., *J. Nutrition*, 1944, **28**, 289.

³ Bloor, W. R., and Knudson, A., *J. Biol. Chem.*, 1916, **27**, 107.

⁴ Bruger, M., and Fitz, F., *Arch. Path.*, 1938, **25**, 637.