

terminated by falling-drop procedures⁸ standardized by Kjeldahl analysis. Time and voltage are given in Fig. 1.

Component analyses were made in measurements in photographic enlargements of the electrophoretic diagrams in which the components were separated by vertical lines to the base at the minima between peaks.⁹ The base line has been removed from the starting boundary by lowering the third blade of the angle slit, in those plates which show no base line. In the latter cases the base line is constructed by drawing lines connecting the portions of the base line remaining at

the extremities of the patterns. The respective areas are bounded by the mid-line of the curve above, and the mid-line of the base below. The mobilities of the various components were calculated from the distances measured from the starting point of migration to the maximum ordinates of the respective peaks.¹⁰ Calculations were made for both the ascending and the descending sides, and the values given in Table I are the average of the 2 sets of data.

Conclusions. The leukocytosis-promoting factor (LPF) of inflammatory exudates when studied electrophoretically in a Tiselius apparatus appears to be distributed primarily between the α_1 and α_2 globulins of exudates.

⁸ Barbour, H. G., and Hamilton, W. F., *J. Biol. Chem.*, 1926, **69**, 625.

⁹ Tiselius, A., and Kabat, E. A., *J. Exp. Med.*, 1939, **69**, 119.

¹⁰ Longworth, L. G., *Chem. Rev.*, 1942, **30**, 323.

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Effect of Feeding Potassium Acid Saccharate in the Diet of Rats for Successive Generations.*

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In former studies with various carbohydrates and their derivatives, calcium arabanate was fed to rats for long periods of time.^{1,2} These compounds failed to affect deleteriously the rate of growth in 3 successive generations of rats. Recently potassium acid saccharate has been made available for experimental purposes and certain dietary uses. It was deemed advisable to conduct similar long-term feeding experiments with rats in which this compound was incorporated in their diet. A search of the literature failed to reveal any information on the fate of

saccharic acid in the animal body.

Material and Methods. Potassium acid saccharate is a white crystalline powder having a pleasant acid taste. It is only slightly soluble in cold water but soluble in hot water. The compound employed in this investigation assayed not less than 99.5% purity and conformed to the heavy metals limit of 10 parts per million established by the United States Pharmacopoeia XII, p. 371, for potassium bitartrate. The compound was free of oxalic acid and gave a negative test for the nitrate ion. Various samples had neutralization equivalents ranging from 248.5 to 273.

The compound was added to a balanced diet of Purina Fox Chow in a concentration of 5%. The powder was mixed intimately with the food and fed to the animals. Special care was observed to insure the complete consumption of all the food. The rats were

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

² Carr, C. J., and Krantz, J. C., Jr., *Proc. Soc. Exp. Biol. and Med.*, 1945, **59**, 54.

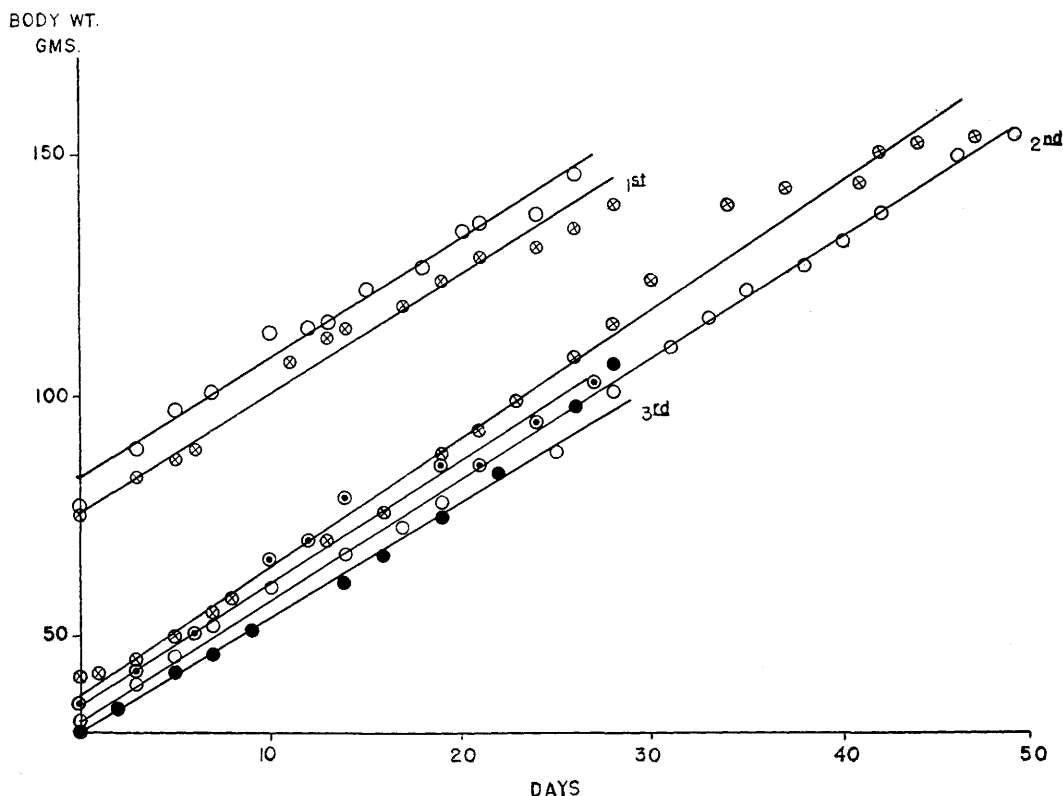


FIG. 1.

Growth curves of first, second, and third generation rats fed 5% potassium acid saccharate. ○ = experimental animals 1st and 2nd generation; x in ○ = 1st and 2nd generation control animals; dot in ○ = 3rd generation control animals; ● = 3rd generation experimental animals.

unable to select certain portions of their diet and reject the experimental compound. Water was allowed at all times. Greens were fed once weekly.

Fifteen young male and 15 young female rats were selected for this study. A similar grouping of 15 males and females comprised the control groups. The average weight of these animals was 76 g; the smallest weighed 73 and the largest 80 g. All animals were weighed on alternate days and males and females were kept separate. A growth curve of the body weights of the experimental and the control groups is given in Fig. 1. The food consumption of the animals fed the experimental diet was compared with the animals on the control diet at periods of time during the experiment. Both groups of animals consumed on the average approximately 10 g of food per rat per day, indicating that the presence of the potassium acid saccharate

in their diet was not objectionable to the animals from the standpoint of taste. Periodically male and female animals were sacrificed for histologic examination of the 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 for the 3 generations compared with untreated animals (Fig. 1).

First Generation Rats. These animals produced 126 young in 71 days. The average weight of the young of rats fed the potassium acid saccharate diet, at the time of weaning (21 days) was 26 g. The average weight of the control animals at time of weaning was also 26 g. The control animals produced 99 young in a similar time period. Throughout this period the animals appeared in a good nutritional state. After 71 days the breeding was discontinued but the ani-

mals continued to receive the potassium acid saccharate in their food. At the termination of the experiment these animals were sacrificed and the organs subjected to microscopic examination.

Second Generation Rats. Twenty-five animals from each group were selected at the time of weaning and their growth rate recorded. The offspring of experimental animals continued to receive the potassium acid saccharate diet; the control animals received the basic diet. At this time males and females were separated. At the completion of the growth curve experiment the animals were mated. The remainder of the animals continued to receive the potassium salt in their food. All of these rats remained in an excellent nutritional state. These rats produced 78 offspring in 42 days; the control animals produced 73 young in a similar time period. The average weight of the young of both groups was approximately the same at the time of weaning.

Third Generation Rats. A similar grouping of the third generation animals was made and their growth rate recorded (Fig. 1). When these rats had attained a body weight of 150 g the experiment was terminated. All of these animals remained in excellent nutritional condition.

Histologic Examination of Viscera. A total of 47 animals were autopsied after receiving the 5% potassium acid saccharate di-

et for varying periods of time. Grossly, these animals exhibited no pathological lesions in any of the important viscera. Sections of the liver, kidney, spleen, duodenum, pancreas, heart, sternum, brain and lungs were prepared for microscopic examination after staining with hematoxylin and eosin. Histologically these sections appeared normal and compared favorably with similar sections prepared from 5 of the control animals. Five first-generation animals that received the potassium acid saccharate diet for approximately 7 months exhibited no abnormalities either grossly or histologically upon autopsy. It is estimated that each of these animals consumed approximately 105 g of potassium acid saccharate in their food throughout this time period.

Conclusions. The feeding of 5% potassium acid saccharate 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 liver, kidney, intestinal tract, pancreas, heart, brain, bone, spleen or lungs of these animals. Subsequent experiments are planned to determine the fate of this compound in the animal body.

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