XCV. A NOTE ON THE BASAL VITAMIN B-FREE DIET OF DRUMMOND AND WATSON.

BY ALFRED LOUIS BACHARACH.

From the Glaxo Research Laboratory, Glaxo House, Osnaburgh Street, N.W. 1.

(Received June 25th, 1925.)

IN the testing of food-stuffs and other substances for the growth-promoting water-soluble vitamin, it has been customary to use a basal diet, described by Drummond and Watson [1922], of the following composition:

	Parts
Purified caseinogen (preferably alcohol-extracted)	20
Rice starch	55
Butter fat	15
Salt mixture	5
Orange juice	5

In a test laid down by the Accessory Food Factors Committee of the Medical Research Council and the Lister Institute, this diet has been slightly modified as follows:

	Parts
Caseinogen (vitamin B-free)	20
Rice starch	60
Cod-liver oil	2
Vitamin A-free oil or fat	8
Salt mixture (McCollum's, plus trace KI) ...	5
Lemon juice	5

It was suggested to us by Dr G. A. Hartwell that the presence of lemon juice in this diet may be undesirable, as lemons have been reported to contain appreciable quantities of the vitamin in question. Osborne and Mendel [1920] found vitamin B in "the edible parts of the orange, lemon..." according to the report on Accessory Food Factors (Second Edition, 1924), which gives both orange juice and lemon juice a single + for vitamin B.

A preliminary series of experiments suggested that there was a slight but distinct advantage to be gained by omitting lemon juice from the diet; that no complications would follow this omission was to be expected from the observation, frequently made, that the white rat can thrive for a considerable period in the absence of anti-scorbutic factor.

To settle the matter, 12 young male albino rats from an intensely inbred stock were fed on diets which are made sufficiently clear by reference to Fig. 1.

Fig. 1.

X, standard diet.

X-L, standard diet with lemon juice omitted.

M, 0.4 g. marmite per animal per day.

D, animal died or was moribund.

The following points emerge from consideration of the growth curves:

- (1) Rats on diet X showed distinctly better growth than rats on diet X-L.
- (2) Rats on diet X for 21 days and then on diet X-L for a further 7 days, though very small and enfeebled, recovered rapidly on administration of vitamin B.
- (3) Rats on diet X-L for 20 days were unable, when subsequently fed diet X, to survive more than a further 3 or 4 days.

(4) Rats fed diet $X - L$ for 7 or more days at no time weighed more than 2 g. more than at the beginning of the experiment.

(5) Of six rats on diet X , after 11 days four weighed from 5–10 g. more than at the beginning of the experiment.

(6) Rats which had been on diet $X - L$, when fed vitamin B, recovered very nearly as rapidly as rats on diet X similarly supplemented.

These results appear to be susceptible of two alternative explanations. The omission of lemon juice from the basal diet certainly involves the omission of vitamin C, and possibly involves the omission of vitamin B. It has been shown that the small amount of anti-scorbutic factor (0.5 cc. lemon juice per animal per day) has no effect on the growth of the rat over the periods involved in these experiments [Harden and Zilva, 1918; Drummond, 1919; Parsons, 1920]. It seems, therefore, probable that the explanation of these results lies in the previously established fact that lemon juice contains appreciable amounts of vitamin B. The results also show that, as a practical question of experimental technique, its omission from the diet is desirable and attended by no disadvantages.

SUMMARY.

Cessation of growth of the white albino rat on a diet free from vitamin B can be secured in about 7 days by feeding the basal diet of Drummond and Watson, but without the addition of lemon juice. No disadvantage attends this omission during the experimental period involved.

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