CX. A PRELIMINARY NOTE ON THE DESTRUCTION OF VITAMIN B BY AGE.

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ALTHOUGH much work has been carried out on the destruction of vitamin B by such agencies as heat and oxidation, comparatively few investigators have examined the question of the loss in the vitamin B content of natural food-stuffs caused by the mere passage of time.

Vedder and Williams [1916] found that unpolished rice stored in a warm moist place for one year retained its power of curing polyneuritis in pigeons. While this paper was in course of preparation there appeared a communication by Jansen [1923] who states that a sample of rice which had been stored as paddy for 100 years was found to have lost, as compared with new rice, little or none of its anti-beriberi vitamin. The question as to whether the anti-beriberi vitamin is identical with the vitamin B, growth-promoting factor is still unsettled. In the present paper a preliminary account is given of investigations on the vitamin B content of seeds stored under constant conditions for a number of years.

Through the kindness of Professor Watson of the Department of Agriculture of the University of Edinburgh, I was provided with a supply of certain Indian lentils which are known to have arrived in this country in the spring of 1886. They are thus at least 38 years old. During the whole of this period they have been stored in canvas bags in a dry cupboard in the Department of Agriculture. All the seeds had lost the power of germination. The different lentils examined included:

1. *Cicer arietinum* Linn.—“Butt” (yellow variety).
2. *Phaseolus mungo* Linn.—“Sona Moona” (golden yellow in colour).
3. *Cejanus indicus* Spreng.—“Ahar” (yellow-ochre variety).
4. *Phaseolus radiatus* Linn.

Unfortunately, it was not possible to obtain supplies of fresh lentils for comparison with these seeds of 1886, but luckily, their vitamin B content has recently been investigated by Ghose [1922]. Although no data are given by him as to the age of the seeds used, it is to be presumed that they were not more than two or three years old. Ghose found that the addition of 1 g. of any of the above lentils to a standard diet lacking vitamin B was sufficient to promote adequate growth in rats. No observations, however, were made as to whether 1 g. was the minimal amount necessary to ensure growth.

In order to compare my results with those obtained by Ghose, the technique adopted was closely similar, except that all faeces were removed from the cages twice daily, since by devouring their own faeces it is possible that rats may obtain small supplies of vitamin B. The rats used were slightly lighter than those employed by Ghose—the average weight at the beginning of the experiment being about 40 g. The results obtained by the addition of 1, 2 and 3 g. of lentils to the standard diet lacking vitamin B are shown in the charts, where each curve represents the average weight of four rats. It will be seen that growth occurred after the addition of 3 g., but not after the addition of 1 or 2 g.

Experiments were also carried out with *Pisum sativum* which had been stored for 38 years. Here, again, the addition of 3 g. to the standard diet gave adequate growth, while no growth was obtained by the addition of 1 or 2 g. of the pea. The power of germination had been entirely lost.

CONCLUSIONS AND SUMMARY.

Samples of Indian lentils and peas kept for 38 years still contain appreciable quantities of vitamin B. In comparison with the observations of Ghose, however, they appear to have lost a small amount of their vitamin B content, even if allowances are made for the slight differences in technique previously described.

Seeds which have lost the power of germination have not necessarily lost all their vitamin B content.

The whole question of the destruction of vitamin B with age is obviously one which requires further and fuller investigation, more especially in regard to the effects of different climatic conditions, *e.g.* heat and moisture, on the rate of destruction.

I desire to express my thanks to Professor Watson and Dr Smith for their kindness in supplying me with seeds, as also to Lieut.-Col. McKendrick for his continued interest in this research.

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