

## NOTE ON THE VARIATION IN THE VITAMIN B<sub>1</sub> ACTIVITY OF RAW WHEAT GERM

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(With 3 Figures in the Text)

ARISING out of the routine selection of wheat germs for the production of a composite high-value and reasonably uniform mixture, it has been found that the variation in the vitamin B<sub>1</sub> activity of unselected wheat germ is greater than has been generally suspected.

The following values have been published:

- |  |   |
|--|---|
| (1) 10.9 units per g. (Coward, 1933).            |   |
| (2) 7.0*   | } |
| 6.9  |   |
| 7.2  |   |
| 7.0  |   |
| (14.0)   |   |
| (3) 7.0 units per g. (Morgan & Frederick, 1935). |   |
- units per g. (Birch & Harris, 1934).

The examination of 118 consecutive samples has revealed at least a fivefold variation, and it has been thought worth while to consider this variation in some detail.

The samples reported on were drawn from eleven different sources of supply. Before assay, the bran, middlings and flour had been removed and the samples therefore consisted of cleaned germ only. For practical purposes only germs yielding, when mixed, a minimum average value of 11–15 units per g. were required, and germ giving consecutively two or more poor values has been rejected.

The germs are not tested with any predetermined regularity but as animals are available, and thus the selection may be regarded as likely to be representative. The average activity is, however, likely to be higher than it might have been if the tests had not been carried out with a view to selecting good germ from the total, since more values are available from accepted than from rejected sources.

The samples assayed have been collected over a period of several months and variation is shown by the use of the same test dose (0.2 g.) over the whole period.

The method of assay has been that depending on the cure of induced bradycardia in the rat. This was first developed by Birch & Harris (1934), and its reliability has since been confirmed by Baker & Wright (1935) and Sankaran & Krishnan (1936). The error of the method is in the neighbourhood

\* The same sample tested by different methods. The figure in brackets was thought by the writers to be unreliable.

of  $\pm 20$  per cent. The value in each test sample is calculated by reference to a curve simultaneously obtained, in which the average duration of cure, in days, is plotted against the dose, in units of International standard acid clay (Fig. 1).

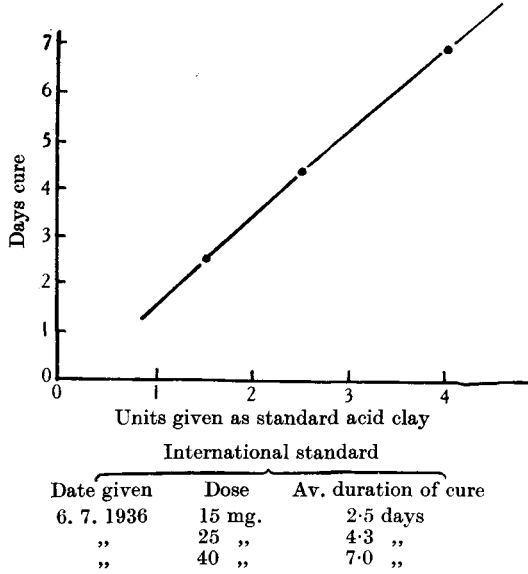


Fig. 1. Example of type of standard curve obtained weekly

The values obtained by 118 consecutive samples are distributed according to the frequencies shown in Fig. 2.

58 per cent of all the values occur between 10 and 16 units per g., the peak of the curve being in the neighbourhood of 13 units per g.

Fig. 3 shows the frequency distribution of samples of germ subsequently rejected.

Their rejection has no effect on the position of the modal peak, but reduces the number of low values and thus raises the average value of all the samples.

Table I shows that where a large enough number of tests have been made of samples from a single source, a similar distribution is found, the range

Table I

Source of germ	Units per g.											
	4	4-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22	22	
A	1	1	-	-	-	-	-	-	-	-	-	} Rejected
B	-	1	1	1	-	-	-	-	-	-	-	
C	1	1	2	-	-	1	-	-	-	-	-	
D	-	1	-	1	2	-	1	-	-	-	-	
E	-	-	-	2	1	2	-	-	-	-	-	
F	-	-	1	-	2	5	5	1	-	-	-	} Accepted
G	-	-	2	1	2	2	4	-	1	-	-	
H	-	-	2	-	4	5	-	1	1	-	-	
J	1	-	2	4	3	7	4	2	1	-	-	
K	-	-	1	2	7	3	1	3	2	-	1	
L	-	-	-	-	3	2	2	6	-	1	1	

between maximum and minimum values being several times greater than the limits of experimental error.

It has not yet been possible to correlate the vitamin activity with any physical or chemical characters of the germ.

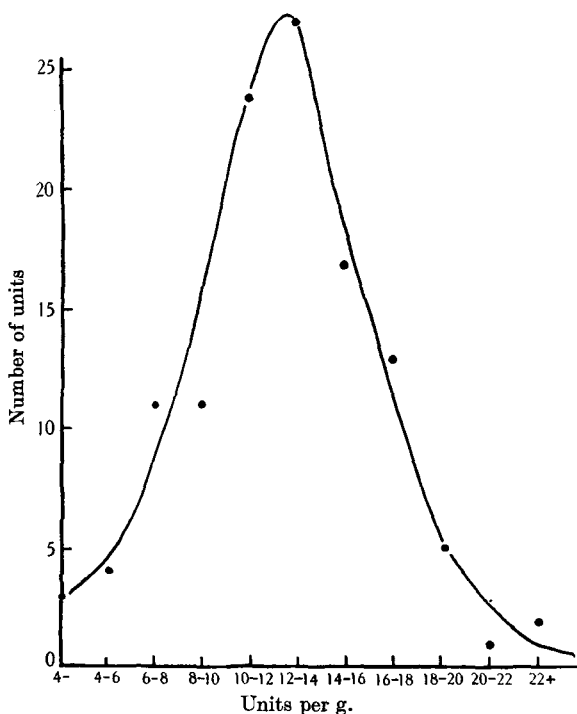


Fig. 2. Frequency distribution. Vitamin B<sub>1</sub> activity of 118 samples of raw wheat germ.

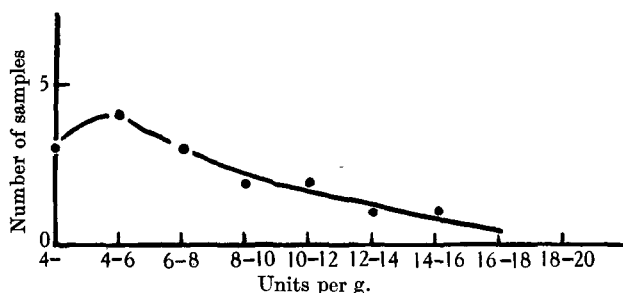


Fig. 3. Frequency distribution. Samples from subsequently rejected sources.

This short note is being published because it is felt that, although yeast is known to show a tenfold variation in vitamin B<sub>1</sub> activity (Quinn, Whalen & Hartley, 1930), wheat germ has been regarded as a less variable source; but it is clear that in order to secure a germ mixture of high activity it is necessary to carry out frequent assays on all sources of germ employed. The variation, as shown in these 100-odd unselected samples, would appear to be approximately fivefold.

## REFERENCES

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