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Letter to the Editor

ESTIMATION OF SERUM FOLIC ACID ACTIVITY

We have independently described methods for the assay of folic acid activity in human serum[1,2]. The lower limit of the normal range by both methods was 2·1 mμg. per ml. and in both methods the medium contains ascorbic acid. Temperley and Horner[2] showed that when ascorbic acid is included in the medium the results on serum are lower than in its absence. They suggested that the inclusion or otherwise of ascorbic acid in the medium may partly explain the widely different normal ranges found by different authors, *e.g.*, 2·1 – 28 mμg. per ml.[1], 2·1 – 9·5[2], 7 – 15·9[3], 5·9 – 21[4], 2·7 – 18·5[5], and 3·2 – 15[6].

In view of the close correspondence between the lower limits of the normal ranges found by us, we decided to exchange samples of serum to compare the results by the two methods. Twenty-three samples were sent from Oxford to Dublin and 25 samples from Dublin to Oxford. All the samples contained 5 mg. ascorbic acid per ml. and were sent by ordinary letter post or by air mail in screw-capped glass containers or stoppered plastic phials, without refrigeration.

The results are shown in Table I. There was a high degree of correlation between the two sets of values ($r = 0{\cdot}976$, $P << 0{\cdot}001$). Following publication of the aseptic addition method[3], seven samples were estimated in Oxford by this technique, in the same experiments as the estimations by the standard technique. These results are included in Table I and are generally slightly higher than those by the standard method, but the difference is not significant ($t = 2{\cdot}106$, $0{\cdot}1 > P > 0{\cdot}05$). This suggests that the aseptic addition method gives results comparable to those by one of our methods[1] when ascorbic acid is included in the medium, despite the normal range of 7 to 15·9 mμg. per ml. published for the method[3]. A further point to be considered in connexion with the aseptic addition method is the recent evidence that serum from patients with certain diseases contains growth inhibitors for *Lactobacillus casei*[7]. In view of this, results by this method may not always be valid.

We present these data to show that two different methods, one using medium prepared in the laboratory and the other using a commercial medium, give comparable results; a third method also gave comparable results when the experimental conditions were similar to those of one of the first two methods. These results emphasize the need for general reconsideration of methods for the estimation of serum folic acid activity in order to achieve greater comparability of results from different laboratories.

TABLE I

FOLIC ACID ACTIVITY IN 49 SAMPLES OF SERUM DETERMINED BY DIFFERENT METHODS

Folic Acid Activity (mμg. per ml. serum)

Dublin	*Oxford*	*Dublin*	*Oxford*	*Dublin*	*Oxford*	*Dublin*	*Oxford*
9·1	10·4	2·2	1·3	4·0	3·1 (3·6)[1]	4·5	4·6
0·25	0·6	2·4	2·8	1·0	1·4	6·7	6·5
6·2	8·6	2·0	1·9	0·6	0·8	6·5	6·1
2·7	3·0	4·2	3·0	4·1	4·2	2·8	2·5
1·7	2·2	1·9	1·3	2·2	1·9	2·0	1·6
4·1	5·2	2·0	1·9	1·2	1·4	1·5	1·5
1·8	2·4	3·6	4·2	4·2	4·1	11·6	12·6
5·4	7·6	4·9[2]	4·9	1·6	1·7	3·7	3·3
1·0	1·6	4·2	4·3 (5·1)	4·4	4·4	5·8	6·5
5·4	6·5	4·8	5·1 (5·3)	0·6	0·9	2·4	2·9
6·8	6·0	3·4	3·0 (3·8)	5·7	5·8	3·3	4·0 (4·7)
2·2	2·5	10·8	10·8 (11·3)	3·6	3·7	13·8	14·1
						—	1·0 (1·0)

[1]Figures in parentheses are the results measured in Oxford by the aseptic addition method
[2]This value is the mean of several results, range 3·9 to 6·0

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