LETTER TO THE EDITOR

Improvement in Determination of Available Lysine in Cottonseed Meals

Dear Sir:

In a previous paper (Frampton, V.L., and J.C. Kuck, JAOCS 50:304 [1973]) concerned with sources of error in the determination of available lysine in cottonseed and peanut meals in the Rao, et al., procedure (Rao, S.R., F.L. Carter, and V.L. Frampton, Anal. Chem. 35:1927 [1963]) (which is used extensively in the evaluation of oilseed meals), it was shown that the major source of error is attributable to sampling errors when the sampling is typically that used in conventional assay. It was reported (Frampton, V.L., and J.C. Kuck, JAOCS 50:304 [1973]) that the error in the assay is ca. 0.5% after the sampling error is accounted for.

The data reported here show that the time of hydrolysis of the dinitrophenylated cottonseed protein by aqueous HCl may be reduced from the 18 hr period proposed by Rao, et al., (Rao, S.R., F.L. Carter, and V.L. Frampton, Anal. Chem. 35:1927 [1963]) to 4 hr without materially affecting the precision of the method. The effect of hydrolysis time is shown in Table I. The ratio of the variance due to time of hydrolysis to the variance between duplicate analyses for 4, 8, and 18 hr was determined to be 0.6. This ratio for 2 and 3 degrees of freedom is not significant.

The samples used here was prepared from a cottonseed meal as described by Frampton and Kuck (Frampton, V.L., and J.C. Kuck, JAOCS 50:304 [1973]). The dinitrophenylated sample was hydrolyzed with 200 ml of 6 N aqueous HCl at the reflux temperature for 2, 4, 8 and 18 hr. The hydrolyzate then was cooled and filtered through a sintered glass funnel directly into a 250 ml volumetric flask. The filtrate and washings then were brought to volume, and 2 ml aliquots were chromatographed on columns (packed with size B Amberlite IR-120) in accordance with Rao, et al., (Rao, S.R., F.L. Carter, and V.L. Frampton, Anal. Chem. 35:1927 [1963]). The absorbance of the effluent was determined with a model B Beckman spectrophotometer at 435 nm. The available lysine then was calculated based upon the total nitrogen of the meal sample, as given in the Rao, et al., method (Rao, S.R., F.L. Carter, and V.L. Frampton, Anal. Chem. 35:1927 [1963]).

TABLE I

Effect of Time of Hydrolysis upon Determination of Available Lysine

Sample no.	Hydrolysis time (hr)	g Available lysine/16 g meal nitrogen
1-A	2	3.37
1-B	2	3.43
2-A	4	3.81
2-B	4	3.78
3-A	8	3.84
3-B	8	3.78
4-A	18	3.78
4-B	18	3.78

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