

COMMUNICATION TO THE EDITOR

Modification of the Polarimetric Starch Determination on High-Amylose Corn

DEAR SIR:

The polarimetric method of determining starch content of cereal grains as described by Earle and Milner (3) (except that uranyl acetate was used in place of stannic chloride) and also in *Cereal Laboratory Methods* (1) has been used at the Northern Regional Research Laboratory, as well as at many other research and industrial laboratories, for many years. Satisfactory results have been obtained in determining the starch content of ordinary dent and waxy corns and of the various fractions from wet-milling the corns. However, low values for starch content have been obtained when this method has been used on high-amylose corns and/or their fractions. In some cases we had difficulty in accounting for as much as 10% of the starch. Apparently high-amylose corns do not disperse as readily or as completely in the calcium chloride solution as do ordinary dent varieties. Sloan *et al.* (5) and Wolff *et al.* (6) have commented on the resistance of high-amylose starch to dispersion in aqueous media.

We have found that the polarimetric procedure can be made suitable for determining starch content of high-amylose corn by minor modification. Following suggestions from the literature (2,4), experiments were conducted in which the fineness of grind and cooking time were varied. The results of these tests showed that high-amylose corn must be ground finer than the approximate 40 mesh called for in the Earle-Milner procedure (3). In order to get a more reliable and consistent starch analysis, grinding to 60 mesh was required. These modifications are illustrated in Table I which gives the starch analysis

TABLE I
STARCH ANALYSIS OF CORNS, OBTAINED UNDER DIFFERENT CONDITIONS
OF SAMPLE FINENESS AND COOKING TIME

DEGREE OF GRIND	COOKING TIME (MINUTES)							
	Ordinary Dent		57% High-Amylose		67% High-Amylose		75% High-Amylose	
	15	30	15	30	15	30	15	30
<i>mesh</i>								
20	69.6	73.1	53.3	59.5	59.5	63.0	45.0	54.3
40	72.8	73.5	61.5	61.7	64.3	64.5	56.3	57.5
60	72.5	73.7	62.3	61.9	65.1	64.9	59.3	59.8
80	73.6	72.8	62.4	61.6	65.8	65.7	59.5	58.6

of several high-amylose corns obtained under different conditions of sample fineness and cooking time. When the corn was properly ground, the effect of cooking time was negligible.

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July 20, 1962

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