COMMUNICATION TO THE EDITOR

Obtaining Damaged Starch Mathematically Rather Than Graphically by the Sandstedt and Mattern Procedure

DEAR SIR:

Sandstedt and Mattern (*Cereal Chem. 37:* 379; 1960) recently proposed a method for the quantitative determination of damaged starch of flour. In this method o/o maltose produced after 1- and 2-hour digestion periods, in the presence of excess amylase, is plotted versus time and the intercept of the straight line with the origin taken as o/o maltose from damaged starch, or o/o damaged starch.

An observation in our laboratory by one of us (Jocelyn Rosen) has led to a simplified procedure for calculating, rather than obtaining graphically, starch damage via the Sandstedt and Mattern method. The development of this modification is as follows:

It may be shown from analytical geometry that the equation of a line through two points (x_1, y_1) and (x_2, y_2) is

$$\frac{y - y_1}{x - x_1} = \frac{y_2 - y_1}{x_2 - x_1}$$

If the x axis of the starch damage curve is time in hours, and the y axis o/o maltose, we may assign the following values:

$(x_1, y_1) = (0, y_1) =$ o/o maltose at 0 hour of digestion
$(x, y) = (1, y) =$ o/o maltose at 1 hour of digestion
$(x_2, y_2) = (2, y_2) =$ o/o maltose at 2 hours of digestion

Substituting these coordinates into the above equation for a straight line and solving, we obtain the relationship:

$$y_1 = 2y - y_2$$

where $y_1 =$ o/o damaged starch
$y =$ o/o maltose after 1 hour digestion
$y_2 =$ o/o maltose after 2 hours digestion

The above relationship can then be used to make a simple calculation for damaged starch, eliminating the need to plot data.

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