Analysis of Total Starch
Midwest Laboratories, Inc. Method Summary

Introduction:

The analysis of starch at Midwest uses modified AACC- 76-13.01/AOAC 996.11 methods. The basic protocol is to convert the hydrolysable starch into individual glucose molecules and then measure the amount of glucose (also known as dextrose) present using a glucometer. The test procedure cannot measure resistant starch or differentiate between indigenous glucose and that glucose produced by the enzymatic breakdown of the starch.

Reference Methods:

AACC 76-13.01 – Total Starch Assay Procedure (Megazyme Amyloglucosidase/alpha-amylase Method)

AACC 76-11.01 – Starch – Glucoamylase Method with Subsequent Measurement of Glucose with Glucose Oxidase

AOAC Official Method 996.11 – Starch (Total) in Cereal Products

AOAC Official Method 979.10 – Starch in Cereals – Glucoamylase Method

Method Summary

The analysis of starch involves two basis steps. The first step is the enzymatic hydrolysis (breakdown) of starch into glucose, since glucose molecules comprise starch. The second step is the measurement of glucose levels.

The submitted sample is ground or processed to provide a homogenous sample and from that sample, the analyst takes a sub sample. The amount of sample depends on the expected level of starch present. The sample is then treated to relax the starch molecules so the enzymes can be more efficient in breaking down the starch. The sample is combined with water, a buffer, and an enzyme (Amyloglucosidase) is added and the solution placed in a controlled-temperature water bath. After a designated period of time to allow the enzyme to break down the starch macromolecules into the individual glucose monomers, the sample is removed and allowed to cool.

The extracts are filtered and then an aliquot placed in a test tube that is analyzed by the Glucometer. In the instrument, the dextrose reacts with glucose oxidase that releases hydrogen peroxide as a by-product. The instrument measures the amount of hydrogen peroxide produced and the software correlates the amount of hydrogen peroxide produced to the amount of glucose present.