

IRISH POTATO PRODUCTS

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Introduction:

The synthesis of starch or its degradation to simple sugars is an important reaction in post-harvest commodities. In potatoes, simple sugar accumulation is undesirable since they can cause texture, flavor and color problems in the processed product. The conversion of starch to sugars (sucrose, glucose, and fructose) is promoted when the tuber is stored at nonfreezing temperatures below 40-45°F.

Reducing sugars (glucose, fructose) when heated in the presence of the free amine groups create brown pigments. This reaction is commonly referred to as the Maillard reaction, and the Maillard reaction is extremely important in processed foods. In the production of Irish potato products, excess levels of reducing sugars result in undesirable level of browning in the final product; therefore, the Irish potato processing industry takes great care to carefully maintain the proper storage conditions of their raw products.

Purpose:

The purpose of this laboratory is to demonstrate the effect of storage conditions of final product acceptability.

Materials:

Irish potatoes stored 4-6 weeks at either 40°F (refrigerator) and at 70°F (in the dark).
Deep Fat Fryer
Vegetable Processor
Colorimeter
Glucose Strips or Glucometer
Dry matter oven and pans

Procedure:

The stored potatoes will be used to make French Fries. Peel potatoes and cut into slabs. Divide the slabs for three purposes: A) frying, B) dry matter determination, and C) sugar analysis.

A. Frying:

After slicing, dry 10-15 potato slabs from each treatment sample using paper towels to remove surface moisture, and then fry in 350°C oil for 3-5 min or until done. Hold for flavor and color evaluations.

Question What happens when potatoes are stored at low and high temperatures?

B. Dry Matter Determination:

Grind each treatment sample. Weigh out 3-5 g samples (3 per treatment), record actual weight to 5 decimal points. Dry at 60°C in a vacuum oven overnight. Next day remove samples from the oven, store in a desiccator, weigh and record weight to 5 decimal points. Calculate % Dry Matter = (Dry weight/Beginning Weight) x 100

C. Sugar Analysis:

Extract liquid from raw potatoes and analyze per instructions of Glucose Strips/Glucometer. Soluble solids (sugars) can also be obtained using a refractometer.