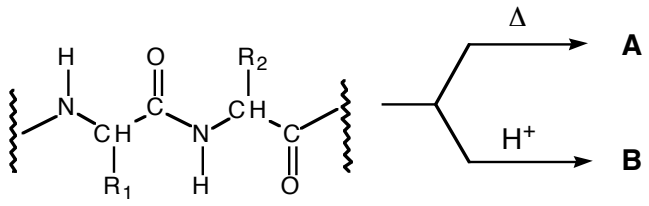
Synthesis and Analysis of High Calcium Semi-colloidal Denatured Protein Media



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1. Procedure

A. Heat-denatured Protein. Eggs (4) are beaten until smooth. In a separate vessel, cornstarch (1.5 T), sucrose (2 c), cocoa (4 T) and sodium chloride (0.1 t) are combined. The egg and sugar mixtures are combined and blended thoroughly, then added to milk (1.5 qt) in a suitable reaction vessel. The reaction mixture is heated with constant stirring to the boiling point. Heating at the boiling point (Note 1) is continued until evidence of thickening occurs. The mixture is transferred quantitatively to the cooling chamber, where it is mixed with additional milk (or cream, see Note 2) to bring the reaction volume to roughly two-thirds the volume of the cooling chamber. Vanilla (6 T) is added and the mixture is subjected to stirring and cooling as specified in the instructions accompanying the cooling chamber (Note 4). When some solidification is noted, the processing is interrupted to allow introduction of a catalytic amount of shaved chocolate. Stirring is continued until the torque requirements indicate suitable solidification of the product.

B. Acid-denatured Protein. Peaches (~1200 g) are homogenized and combined with the extracted juice of 2 lemons. Milk (4 c), cream (3 c), sucrose (1.5 c) vanilla (1 T) and alcoholic benzaldehyde (0.25 t) are added to the fruit mixture and subjected to stirring and cooling as described for *A*.

2. Notes

1. Avoid alternate procedures utilizing eggs that have not been heat-denatured due to the associated salmonella risk.

2. Heavy whipping cream, milk, and half-and-half can generally be substituted for one another without significant product degradation.

3. Alcoholic benzaldehyde is available from a number of suppliers under the name 'almond extract'.

4. In the absence of instructions, utilize a salt-ice mixture consisting of 1 part NaCl and 6 parts ice for optimum cooling. Exercise caution to avoid contamination of the product with salt-water around the lid of the reaction vessel.

Waste Disposal Information

The only significant disposal issue is the potential for vegetative kill if the contents of the NaCl-ice slurry are to come in contact with plant materials. Disposal in the sanitary sewer system is recommended.

3. Discussion

The reactions proceed in good yield with overall expansion relative to the volume of the starting solutions. The heat-denaturing process avoids some of the safety concerns of procedures calling for raw eggs (Note 1). Acid-denaturing allows even simpler processing of the product. Alterations in the flavor components are possible by simple trial and error. Successful analysis of the final product is best accomplished with the assistance of the scientific staff who collaborated on this experiment. Typical results show that the products compare favorably with manufactured products labeled ice cream.