New Approaches to Gelling Agents in Confectionery

INTRODUCTION

This paper will deal mainly with the use of the gelatin and pectin in gelled confectionery.

Although those ingredients are not necessarily new in the production of confections, I think that the new approach to gelation of gelatin and the way gelatin and pectin are combined, can open new perspectives for the confectionery industry.

Gelatin and pectin are two important texturizers in a large range of confectionery products. They are used alone or in combination with other texturizers to manufacture products such as gummy bears, wine gums, pastilles, yogurt gums, deposited licorice products, marshmallows, fruit chews, etc.

In this paper I shall first of all give you a short description of gelatin and pectin (definition, raw materials, characteristics). I shall describe the main differences when used in gelled confections, then discuss the new approach to gelation of gelatin in confectionery, present the possibilities that offer the combination of gelatin and pectin in the production of gelled confectionery, and finally describe the use of combinations of LM pectins + Ca-salts for gelled confections.

GELATIN

Structure

Like all proteins, gelatin is composed of amino-acids, linked together by peptide bonds. Approximately 20 amino-acids are obtained by hydrolysis of natural proteins. Gelatin contains practically all of these, with the following preponderances:

- glycine 27 %
- proline 16 %
- hydroxyproline 14 %

Gelatin contains all the amino-acids essential to man, except tryptophan.

The peptide bond is formed by the condensation of an amino-acid carboxyl group and the amine group of another amino-acid, with elimination of water (Figure 1). Condensation can be repeated several times, producing polypeptide bonds, thus constituting macromolecules similar to those of natural proteins.

Classification

Commercial gelatin exists in a range of gel strengths ("bloom-strength").

The amphoteric character of gelatin, associated with the presence of amine and carboxylic functions, makes it possible to define two types of gelatin distinguished by their isoelectric point.

This is the pH value at which positive and negative charges in the gelatin are balanced.

- type A: pH<sub>i</sub> = 6.3 to 9.5
- type B: pH<sub>i</sub> = 4.5 to 5.2

The pH<sub>i</sub> value depends on the gelatin preparation process use. Acid processes give type A gelatins, and alkali processes type B gelatins.

Properties

Thermoreversible gel. Gelatin swells when placed in cold water, absorbing 5 to 10 times its own volume of water.

When heated to a temperature of 50° to 60°C (122°-140°F), the swollen gelatin dissolves, giving a solution, or "sol," which forms a gel when cooled. This sol/gel conversion process is reversible, and can be repeated.

Gel strength, expressed in grams, is linked to the mechanical elasticity of the gel, and is used to classify gelatins.

The standard measurement procedure, using a gelometer, consists in determining the force required to drive a piston into a gelatin gel, under conditions specified in international standards.

Gel strength is between 50 and 300 Bloom (grams) for 6.67 percent gelatin concentrations.