PROCESS BULLETIN

Fruit Nectars

Description

Fruit nectars are the pulpy, liquid foods prepared from the puree, pulp, juice, or concentrates of the following fruits: apple, apricot, blackberry, boysenberry, cherry, guava, loganberry, mango, nectarine, papaya, passion fruit, peach, pear, pineapple and plum. Apples, cherries, passion fruit and pineapples are used only in combination with other fruits. The proportion of fruit ingredient used on a single strength basis is not less than 25% for guava nectar, not less than 33-1/3% for papaya nectar, not less than 35% for apricot nectar and not less than 40% for the others. Other ingredients mixed with the nectar are sweetening agents such as sugar, invert sugar syrup, dextrose, corn syrup, dried corn syrup, glucose syrup and dried glucose syrup. Also, acidifiers such as lemon juice, concentrated lemon juice, citric acid, malic acid and fumaric acid may be added. Ascorbic acid is sometimes used as an antioxidant preservative or as a vitamin.[1] This description originally appeared in the U. S. Standard of Identity (Food and Drug Administration) but is no longer listed. Obviously, this standard may vary in other countries as to type of fruit and concentrations. The final ingredient used is water, and it is added to give a product of 12-15° Brix (degrees Brix is the percent by weight of sucrose).

In general, the pulp and juice are obtained from the fruit by cutting open the fruit, separating the pulp and seeds from the skin and then screening out the seeds, leaving the pulp and juice. (The skin or rind may be used as animal feed.) It is important in processing the pulp to deaerate the product. The presence of oxygen in the product causes oxidation and, therefore, loss of color, breakdown of vitamins, loss of flavor and production of off-flavors. Removal of air makes a more uniform and smoother looking product with improved color. It also prevents foaming which will affect the filling of containers.[2]

Objective

The nectars are homogenized, to increase viscosity, to decrease the rate of sedimentation and to enhance flavor. In some countries, such as those of Central America, homogenization is also used to reduce the pulp texture of the nectar. However, in other countries, such as Mexico, the preferred product retains the pulp; therefore, the homogenization conditions are controlled so that the pulp texture is not destroyed.

Equipment and Processing

The usual homogenizing pressure range for nectars is 1000 to 3000 psi, but with high fiber products the pressure used may be up to 5000 psi. The required pressure is greatly dependent on the type of fruit.

The homogenizer usually has a single-stage homogenizing valve assembly. It is fed by a centrifugal pump. In some cases, the nectar may be heated before homogenization. Ball style check valves in the pump chamber usually work best for these products. After homogenization, the product is pasteurized either in a plate heat exchanger or directly in the bottle.

It may be important to heat the nectar to about 75°-90°C. at some point before homogenization and packaging to destroy pectin esterase, an enzyme that destroys the natural fruit pectin. The fruit pectin gives body and viscosity to the fruit, and its loss will severely affect the quality of the nectar.

The quality of the finished product is dependent on the aging of the fruit, the maturity of the fruit, the time of the year, the climate, the region, the variety of the fruit, and, of course, the conditions of processing. The pH of the nectar (usually pH=4.0) can also be important, and in many cases it is closely monitored or adjusted. The desired shelf life of the nectars is between two and six months.

Testing

The nectars are evaluated by shelf life tests, sedimentation, viscosity, and microscopic examination. The rate of sedimentation can be measured by centrifuging samples, and the viscosity can be measured with a Brookfield viscometer. The product may also be evaluated for any changes in color, flavor, texture, pH, vitamin content and soluble solids.

References

1. Code of Federal Regulations, Title 21, 146.113, 1995.

2. D. K. Tressler and M. A. Josyln, eds., *Fruit and Vegetable Juice Processing Technology* Westport, CT: Avi Publishing Compishing Company, 1971.

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