Prune Products

improved processing and new uses developed by research

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Molds and yeasts in packaged prunes can be destroyed by a few drops of propylene oxide.

Partially dried prunes of 28% to 33% moisture—directly off the dehydrater trays and heated sufficiently to destroy enzymes—can be packed and sterilized to keep for months as a tender and juicy product of excellent eating quality.

Research has demonstrated that it is perfectly feasible and practicable commercially to sterilize prunes in plastic-sheet lined cartons by adding a few drops of propylene oxide to the carton and heat sealing in the usual way. The fumigant destroys all molds and yeasts and then evaporates through the walls of the container, leaving the sterilized prunes tender and tasty.

The propylene oxide treatment may revolutionize the prune processing and packing industry.

Prune Juice

The method of producing prune juice in general use today consists in extracting the prunes three successive times with water at or near the boiling point, combining the three extracts, adjusting to 20° Balling and canning or bottling, and sterilizing.

Recently experiments were conducted to improve the quality of prune juice. Flavor and aroma were superior when the prunes were extracted at 175° to 185°F instead of at the boiling point. The juice retained its flavor, color and aroma much longer and more satisfactorily in reënameled tin cans than in plain tin. Bottles were superior to tin cans in these respects.

The addition of about 0.2% of citric acid greatly improved the juice, for most of those who tasted the juices. Very small prunes gave a juice of poor flavor. The experimental juice prepared with these various improvements was found to be considerably superior to several commercial juices purchased in the local market.

Frozen Juice and Concentrate

Juice and concentrate prepared by progressive extractions at 180° to 190° F keep perfectly when stored at 0°F. Prune concentrate prepared to 50° to 60° Brix by the progressive extraction procedure may be packed in paper milk bottles or similar paraffined containers or in jars or cans and preserved by freezing.

While juice as such keeps well frozen it is also very satisfactory when bottled or canned in reënameled cans and preserved by heat sterilization.

Storage Deterioration

Dried fruits deteriorate in color, odor and flavor on prolonged storage and are also subject to infestation by insects, sugar, molding and fermentation where conditions are favorable to these changes.

Even at moisture content below that ordinarily considered necessary for yeast growth, prunes—particularly in bins and boxes—may undergo fermentation by yeasts.

Contrary to previous belief, sulfur dioxide will not permanently prevent prunes darkening in color as darkening is in part due to reactions between amino acids and sugars of the dried fruits.

Dietary Value

Prunes are high in readily digestible carbohydrates, chiefly invert sugar, that are useful sources of energy and tissue building materials.

It is possible that the vitamin B_1 content of prunes may be concerned as one of the factors in the laxative value of prunes. Canning of the prunes and juice does not affect the laxative value adversely.

Prunes and prune juice do not cause dietary acidosis; that is, they do not reduce the carbon dioxide binding power of the blood. Results of thorough tests show that the common belief that prunes lower the alkaline reserve of the blood is unfounded and erroneous.

Prunes are a good source of iron and contain some copper.

It has been determined that prunes are an excellent source of carotene—vitamin A. Their B_1—thiamin—content was fair, at 0.3 to 0.5 milligrams per 100 grams; the human daily requirement being about 1.5 to 2.0 milligrams. They were somewhat higher in vitamin B_2 or G—riboflavin—than in B_1, that is 0.5 to 1.8 milligrams per 100 grams.

They were low in the anti-pellagra vitamin, nicotinic acid; 1.5 to 2.2 milligrams per 100 grams. The daily human requirement is 20 milligrams. They contain a moderate amount of the vitamin panothenic acid. All of these vitamins are quite well retained through drying and storage.

Vitamin C is completely lost in the usual methods of drying. It is possible that some vitamin C would be retained by steam blanching before drying. Previous work showed that sulfuring before drying retains much of the vitamin C content of dried fruits, but it destroys vitamin B_1.

Granules and Powders

Prunes and other dried fruits processed in water to about 30% to 35% moisture, puréed, mixed with two to three parts by weight of dextrose, sieved, and dried also can be broken up into granules or powdered. The granules and powders are suitable for preparing drinks simply by the addition of water or milk, and mixing to taste.

The powdered product serves fairly well to flavor milk shakes and ice cream. Both granules and the powder can be used in candies, bread dough, cookie dough and in other ways.

Use in Confectionery

Prunes may be used in preparing jellied candies with pectin, sugar, citric acid, and corn syrup or invert syrup.

A prune jelly made with prune juice, fruit pectin, sugar, citric acid and corn or invert syrup, cooked to the jellying point and then mixed with about twice its weight of chopped pitted prunes gives an excellent candy suitable for cutting into bars or for boxing.

Other Uses

Several other uses for prunes and prune pulp, as in catsup, chutney, jams, butters, preserves, jelly, etc., have been developed.

Prune concentrate has been diluted and carbonated in experiments and then bottled as a carbonated beverage. It is refreshing and healthful.

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The propylene oxide treatment for packing dried prunes was discovered and developed by Professor E. M. Mrak and Assistant Professor H. J. Phaff, Division of Food Technology.

Associate Professor Gordon Mackinney and associates, Division of Food Technology are conducting the research on the problem of color darkening in dried fruits mentioned in the foregoing report.

The research on the dietary value of dried prunes was conducted by Professor Agnes Fay Morgan and staff of the Department of Home Economics and Professor E. M. Mrak, Division of Food Technology.