CALIFORNIA
TABLE GRAPE
COMMISSION

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Freeze-Dried Table Grape Powder Overview

Fresh Grapes

Fresh grapes contain about 82% water, 12-18% sugar, and 0.2-0.8% acid, mainly tartaric and malic acid. Grapes also contain numerous phenolic compounds, including simple phenols, simple phenolic acids, cinnamic acids, stilbenes, flavonoids, flavans, flavonols, and anthocyanins.

Grapes are high in flavonoids and are particularly good sources of flavans. For example, the major phenolic compound in grapes is catechin, and they contain epicatechin, gallocatechin, and epigallocatechin. Grapes also contain high concentrations of leucoanthocyanidin flavans of varied structure. Grapes are good sources of flavonols, primarily quercetin. Red and black grapes contain high amounts of anthocyanins.

Freeze-Dried Table Grape Powder

The freeze-dried table grape powder is to be used for research purposes only. It is a composite of fresh red, green, and black California grapes (seeded and seedless varieties), that have been frozen, ground with food-quality dry ice, freeze-dried, and re-ground using Good Manufacturing Practices for food products throughout. A small amount of silica (1% by weight) is used as a flow agent. The powder was processed and stored to preserve the integrity of the biologically-active compounds found in fresh grapes. As with fresh grapes, the powder is known to contain resveratrol, flavans (including catechin), flavonols (including quercetin), anthocyanins, and simple phenolics.

To estimate the amount of fresh grapes represented by the powdered preparation, moisture content must be taken into account. The dry powder contains approximately 1% moisture and fresh grapes contain approximately 82% moisture. Therefore, 100 g of fresh grapes corresponds to approximately 18.2 g powder. The powder is hygroscopic and should be stored in moisture-proof containers at -70 C. A 3/4 cup serving of fresh grapes (126 g) is equivalent to 23 g of the commission freeze-dried whole table grape powder.

Analysis of Freeze-Dried Table Grape Powder

Each batch of grape powder has been analyzed for a number of phytochemicals. The analysis does not provide the full phytochemical profile of grapes but gives information on several key components. A detailed powder information sheet will be provided to grantees when the grape powder is sent to them.

The phytochemicals analyzed include catechin and epicatechin (catechins); peonidin, malvidin, and cyaniding (anthocyanins); kaempferol, isorhamnetin, and taxifolin (flavonols); and resveratrol (stilbene). A value for the total polyphenol content is also included. A basic nutritional analysis and microbiological analysis are also included on the detailed information sheet for the grape powder.

Table Grape Powder Placebo

The table grape powder placebo is formulated to closely match the freeze-dried grape powder in terms of dietary fiber, sugar profile, organic acid profile, as well as for sensory characteristics of sweetness, tartness, mouthfeel, and viscosity.

The placebo contains fructose, glucose (as dextrose), the two main sugars in the grape powder, organic acids including tartaric, malic and citric acids, and fiber. Artificial colors (FD&C dyes) were used to replace natural color components and avoid any addition of polyphenolic compounds from natural colorants. All flavorings used are free of polyphenolic compounds and antioxidants. The placebo also contains modified food starch and tapioca maltodextrin, two potassium salts, and silicon dioxide (at the same level as used in the grape powder.)