



CALIFORNIA
TABLE GRAPE
COMMISSION

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California Table Grape Commission Freeze-Dried Table Grape Powder Analysis Report (Y2010)

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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. A standard serving size of fresh grapes is approximately 3/4 cup (126 grams).

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, gallo catechin, 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 grape powder

The freeze-dried 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. 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 grams of fresh grapes corresponds to approximately 18.2 grams powder. The powder is hygroscopic and should be stored in moisture-proof containers at -70°C.

Phytochemical Analysis of Freeze-Dried Table Grape Powder (Y2010)

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Compounds	Total	Individual
Catechins	46.9 mg/kg	
Catechin		23.9 mg/kg
Epicatechin		23.0 mg/kg
Anthocyanins	458.9 mg /kg	
Peonidin		45.7 mg/kg
Cyanidin		263.8 mg/kg
Malvidin		149.4 mg/kg
Flavonols		
Quercetin		71.3 mg/kg
Kaempferol		5.43 mg/kg
Isorhamnetin		11.5 mg/kg
Stilbenes		
Resveratrol		.70 mg/kg
Total Polyphenols in gallic acid equivalents		495 mg/100g

Note: The following analysis does not represent the complete phytochemical profile of grapes

Nutrient Analysis of Freeze-Dried Table Grape Powder (Y2010)

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Nutrient	Amount (per 100 g powder)	Units
Calories	370	kcal
Total Fat, acid hydrolysis	.421	g
Total Carbohydrate	88.3	g
Protein (N x 6.25)	3.21	g
Beta carotene	.206	mg
Vitamin A from carotene	343	IU
Vitamin C	2.6	mg
Calcium	51.1	mg
Iron	1.29	mg
Sodium	14.1	mg
Potassium	905	mg
Thiamin HCl	.17	mg
Folic Acid	26.8	mcg
Phosphorus	117.0	mg
Magnesium	32.4	mg
Zinc	.260	mg
Copper	.352	mg
Manganese	.293	mg
Moisture	5.10	g
Ash	2.95	g

Note: Nutrient analyses were performed using standard methods of analysis. References available upon request.

Microbiological Analysis of Freeze-Dried Table Grape Powder (Y2010)

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Microorganism Analyzed	Result	Units
Aerobic plate count	1400	CFU/g
Anaerobic plate count	920	CFU/g
Bacillus Cereus	0 – 1400	CFU/g
Clostridium P.	<10	CFU/g
Coliform		
<i>E. coli</i>	<10	CFU/g
Total Coliforms	< 3	MPN
Listeria	Negative/25g	+/-
<i>Salmonella</i> (rapid method)	Negative/25g	+/-
Staphylococcus Aureus	<10	CFU/g
Yeast and mold count	65	CFU/g