

California Dried Plum Board

Technical Bulletin

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Take A Bite of the 100-Calorie Snack Market with California Dried Plums

Background

Less than two-years old, the 100 calorie snack market is already 44 products (2005) (Datamonitor) and \$115 million in retail sales (IRI excluding Wal-Mart)--up 82.3% over 2004. Control is a key motivation for consumers to purchase the category based on the pre-measured portion size. The idea appeals to consumers who care about portion control but don't want to count calories. With an open full-size package of snacks it is easy to eat much more than 100 calories. The 100-calorie puts a limit on consumption and makes calorie counting extremely easy.

Most important for consumers managing their weight, the 100-calorie value puts an easy-to-calculate number on food intake much like the adoption of the glycemic index by some food processors and consumers.

A weakness of many of these products, however, is that extreme processing and a focus on baked snacks and cookies raises consumer doubts about nutritional value. Many of the calories are empty of nutrition leaving some consumers wanting something more healthy while achieving greater satiety.

Dried Plums--Natural Approach to Calorie Reduction

California dried plums are a natural ingredient for food processors to participate in the 100-calorie snack category. The *d'Agen* plum is the source of dried plums' unique array of naturally occurring features. The *d'Agen* variety is one of just a few that is allowed to fully ripen on the tree without fermenting before harvesting. Seldom has a single ingredient offered such a multiplicity of benefits.

Dried Plums' Weight Control Product Ingredient Benefits

Fiber	7% fiber, half of which is soluble.
Sorbitol	15% sorbitol, more than any other food
Malic acid	1.5-2.0% malic acid to potentiate flavors
Fat free	Thus, no saturated fat and no trans fat
Cholesterol free	No cholesterol
Unique sugars	No sucrose
Low glycemic index	GI of 29 +/-4, GL of 7

Mathematics of Calorie Reduction

Food processors believe 81% of consumers are looking for reduced-fat food formulations to help solve a weight problem. Some 70% of consumers will turn to low-calorie formulations and 62% to reduced-sugar. As for beneficial ingredients, 74% of food processors reported dietary fiber as a key for weight-control products (Prepared Foods 2006 R&D Trends Survey: Weight Control Formulations).

Dried plums contain 2.57 calories per gram. Shortening, on-the-other-hand, contains 8.84 calories per gram. Replacing all or a portion of the shortening in a bakery formula not only reduces the fat content of finished baked goods but also the calories. Also, dried plums add sweetness without the extra calories found in sugar.

For example, if 100% of the shortening is replaced with dried plum puree, the calories are reduced 85%. If 50% of the shortening is replaced with dried plum puree, the calories are reduced by 43%. This calorie replacement is possible due to dried plums' high fruit sugar content. In general, the *d'Agen* plum contains twice as much total sugar at harvest as other varieties of plums.

Carbohydrate Control

Dried plums contain about 62.7% carbohydrates per 100 grams. Thus, when designing 100-calorie snacks dried plums become a natural consideration. The sugars in dried plums do not elevate blood sugar levels very rapidly and their glycemic response or index (GI) is in the low range, i.e. $GI=29 \pm 4$, while the glycemic load (GL) is 7 for a 30 g portion.

The reasons for this low glycemic index are due to the variation in sugar profiles and fiber content of dried plums. Dried plums contain, on the average, 25 g of glucose, 12 g of fructose and 15 g of sorbitol as well as 6-7.5 g of fiber per 100 g.

When compared with the fresh *d'Agen* plum, the concentration of sugar increases in dried plums, because of dehydration, but there are also qualitative changes in the proportion of individual sugars. The most striking change is the nearly total disappearance of sucrose, which is hydrolyzed to glucose and fructose during processing.

100-Calorie Plum Brownie Bars

A brownie bar is a 100-calorie snack with universal appeal. Commercial and retail bakers can easily make this popular bakery snack using dried plum powder. Dried plum powder is 100% dried plums dried down to about 5% moisture. Dried Plum powder is incorporated into bakery mixes along with other dry ingredients to yield a reduced calorie serving that is also reduced in fat. In fact, each 100-calorie brownie bar contains only 3g of fat, 0.5g of saturated fat and not trans fat.

100 Calorie Plum Brownie Bar Formula

INGREDIENTS	PER CENT (%)*
Powdered sugar	36.0
Bleached flour	20.6
Water	22.3
Vegetable oil	6.4
Dutched cocoa	5.3
Dried plum powder	4.5
All-purpose shortening	3.2
Egg white powder	1.1
Salt	0.20
Vanilla	0.20
Sodium bicarbonate	0.20
TOTAL	100.00

* Based on batch weight

Procedure:

1. Preheat oven to 176C (350F)
2. Place dry ingredients in medium bowl. Add shortening, oil and vanilla and stir with paddle on low speed for 1 minute or until evenly distributed
3. Add water and blend approximately 50 strokes by hand, or until mixture is well blended
4. Spread evenly in a 9" X 13" baking pan, greased on the bottom only.
5. Bake for 27 minutes at 176C (350F)

Nutritional Facts

Serving size	30g	
Calories	100	
Calories From Fat	30	
		% Daily Value
Total Fat	3g	5%
Saturated Fat	0.5g	3%
Trans Fat	0g	0%
Cholesterol	0mg	0%
Sodium	40mg	2%
Total Carbohydrate	18g	6%
Dietary Fiber	1g	4%
Sugars	11g	
Protein	1g	
Source: California Dried Plum Board		

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