

# TECHNICAL BULLETIN

## DRIED PLUMS GIVE CONFECTIONERS THE SWEET SOLUTION TO REDUCING FAT

(Using Dried Plums Gets Even Sweeter By Cutting Cost Too!)

### Background

Food processors have been aggressive in responding to consumer demands for reduced/low-fat products. In 1994 1,439 new products were introduced making a reduced/low-fat claim—the greatest number ever and a 70% increase over 1993.

**However, few new confectionery products could be found making this claim** in spite of the fact that a recent survey by the Food Marketing Institute indicated that 65% of consumers consider fat content to be their most important concern in what they eat—up from 59% in 1993.

**Confectionery is one of the two segments of the food industry that has presented the most challenge for fat replacement.** The other is bakery products. While bakers have made progress in successfully reducing and even eliminating fat, few low or reduced fat confection examples exist.

One approach is to reduce the fat in chocolate in confectionery products. But, because the current standards for chocolate don't leave much room for reduced fat chocolate, the possibilities for any immediate change in the regulations appear remote.

**More recent attempts at reducing the fat in confectionery products have attacked the fat in fillings.** Early success with these reduced fat products have been mixed. Like bakery products, taste is the problem. Indulgence foods rely on sensory satisfaction as the primary consumer appeal. The absence of taste and texture even with a reduced fat benefit won't sell indulgence foods because these foods are not purchased as a necessity. This is about to change, however, as confectioners discover that using **dried plums can deliver the delicious flavors of confections without the fat.**

The unique properties of dried plums that have allowed bakers to produce a variety of great tasting cookies, muffins, cakes, and pastries without fat are equally effective in confections. The taste, texture, and satisfaction of full fat confections can now be produced with significant reductions in fat using dried plums.

### Dried Plums Used to Replace Fat

An evaluation of the composition of dried plums by the California Dried Plum Board uncovered a unique combination of naturally occurring components that form a multi-functional *fruit system* responsible for dried plums' fat sparing abilities.

## DRIED PLUMS UNIQUE FRUIT SYSTEM

***Pectin:*** Dried plums contain a unique blend of both soluble and insoluble fiber (total 8.1% about half of which – 4.5% – is pectin) which helps to form a stable film during mixing. The pectins are also believed to have the ability to entrap flavor components for gradual release during mastication.

***Sorbitol/Reducing Sugars:*** Dried plums are unique in their naturally high sorbitol content (15%). Sorbitol, along with the reducing sugars fructose and glucose, work to provide effective humectancy.

***Malic Acid:*** Dried plums contain about 2% naturally occurring malic acid which has been shown to be an effective flavor enhancer. Malic acid is released more slowly than other organic acids, and thus has a greater carry-through during the chewing process. Additionally, malic acids helps to inhibit microbial spoilage.

### Reduced Fat Confections Using Dried Plums

In order to demonstrate dried plums' ability to reduce fat in confections, two products were selected:

- Reduced fat raspberry cereal bars
- Reduced fat Irish cream truffles

Both prototype products contain dried plum puree to reduce the fat in the fillings. Using between 22-46% dried plum puree in these fillings resulted in 30-34% fat reductions of the total confectionery product formulas including the chocolate coating. Important to note was no loss of flavor or texture.

Also, important to note in the case of the reduced fat truffle was a **22% reduction in the cost of the filling and a 15% reduction in the total cost** when using the dried plum puree formula.

Cost comparisons of the reduced fat cereal bar are not possible because multiple control product formulas were considered.

### Reduced-Fat Raspberry Cereal Bars – 30.5% Fat Reduction

The reduced-fat coated cereal bars achieved a one-third reduction in fat with no loss of flavor or texture. In fact, **the uncoated cereal bar has only 1.2 grams of fat in a 40 gram serving and, thus, qualifies as low fat.**

## REDUCED-FAT RASPBERRY CEREAL BARS FORMULA

Ingredient	Coated %	Uncoated %
Vanilla extract (Flavorchem #93.402)	0.413	0.59
Corn syrup 42 DE (Cargill 43/43)	10.773	15.39
Raspberry juice concentrate-68° brix (Bell Marketing)	5.390	7.70
Oats-quick cooking (LaCrosse Milling)	9.520	13.60
Granola-low fat (Soxex)	8.078	11.54
Cookie pieces-graham vanilla (Ringger Foods-Med. #2022)	6.286	8.98
Microfruit-raspberry	1.708	2.44
Oat bran (LaCrosse Milling)	2.388	3.34
Sucrose (Amstar)	7.182	10.26
Non-fat dry milk (Carnation)	3.591	5.13
Nat./art. raspberry flavor (California Brands #24790)	0.357	0.51
Milk chocolate (Merckens MC-050 Marquis)	30.000	0.00
<b>Dried Plum Puree</b>	<b>14.364</b>	<b>20.52</b>
<b>Total</b>	<b>100.000</b>	<b>100.00</b>

**Procedure:** Liquid and solid ingredients are blended separately and fed into extruder. Bake on parchment paper in a 350° F convection oven for 8 minutes.

Extruded using Buhler twin-screw extruder 62mm Bi-Ex/62DNDG equipment at *Buhler pilot plant, Minneapolis, MN*. Bars were chocolate enrobed at *Abdallah Candies, Inc., Burnsville, MN*.

**REDUCED-FAT RASPBERRY CEREAL BARS NUTRITIONAL ANALYSIS**  
**Per Serving (40 grams)**

<b>Component</b>	<b>Traditional Bar Coated</b>	<b>Dried Plum Bar Coated</b>	<b>Dried Plum Bar Uncoated</b>
Calories	187.2	160.0	136.0
Fat (g)	7.2	5.0	1.2
% Calories from fat	34.6	28.1	7.9
Carbohydrates (g)	25.9	20.4	29.2
Fiber (g)	1.3	1.3	1.9
Protein (g)	2.9	2.6	2.5

**Reduced Fat Irish Cream Truffles – 34.4% Fat Reduction**

The reduced fat truffle also achieved over a one-third reduction in fat. The filling of this European style soft **truffle contains 43% dried plum puree.**

**REDUCED-FAT IRISH CREAM TRUFFLES FORMULA**  
**%**

<b>Ingredient</b>	<b>Traditional Truffle</b>		<b>Dried Plum Truffle</b>	
	<b>Filling</b>	<b>Coated</b>	<b>Filling</b>	<b>Coated</b>
Milk chocolate (Peter’s Heritage-Alpine/Superfine)	55.580	72.0	22.88	51.414
Chocolate extract (Star Kay White)	0.000	0.0	1.52	.958
Cream-heavy whipping	32.310	20.0	13.72	8.644
Milk-whole homogenized	0.000	0.0	13.72	8.644
Flavor-Irish Cream (Hiriam Walker)	12.116	8.0	6.20	3.906
<b>Dried Plum Puree</b>	<b>0.000</b>	<b>0.0</b>	<b>41.96</b>	<b>26.435</b>
<b>TOTAL</b>	<b>100.000</b>	<b>100.0</b>	<b>100.00</b>	<b>100.000</b>

**Procedure:** Boil cream and milk and add to dried plum puree with melted chocolate. Add Irish cream flavor. Mix and grind well to optimize smoothness of filling. Use shell-molding equipment to form truffles.

**Samples were produced by Andre’s Confiserie Suiss, Kansas City, MO.**

**REDUCED-FAT IRISH CREAM TRUFFLES**  
**NUTRITIONAL ANALYSIS**  
**Per Serving (40 grams)**

Component	Traditional Truffle		Dried Plum Truffle	
	Filling	Coated	Filling	Coated
Calories	186.60	198.00	137.40	167.50
Fat (g)	12.10	12.50	5.30	8.20
% Calories from fat	58.52	56.70	34.70	44.10
Carbohydrates (g)	13.60	17.20	18.80	20.40
Fiber (g)	.60	.80	1.20	1.20
Protein (g)	1.70	2.00	1.20	1.70

**SWEETENER: *Significant Cost Reductions When Using Dried Plums***

The reduced-fat truffle example serves to demonstrate how using dried plums to lower fat can also significantly reduce ingredient cost. **The cost of the truffle filling in this example was reduced by 22% while the overall cost of the coated truffle was reduced by 15%.**

**REDUCED-FAT IRISH CREAM TRUFFLES**  
**ESTIMATED INGREDIENT COST PER POUND**

Ingredient	Traditional Truffle		Dried Plum Truffle	
	Filling	Coated	Filling	Coated
Milk Chocolate	\$0.94	\$1.22	\$0.39	\$0.87
Chocolate extract	0.00	0.00	0.07	0.04
Cream-heavy whipping	0.15	0.09	0.06	0.04
Milk-whole/homogenized	0.00	0.00	0.02	0.01
Flavor-Irish cream	0.61	0.40	0.31	0.20
<b>Dried Plum Puree</b>	<b>0.00</b>	<b>0.00</b>	<b>0.46</b>	<b>0.29</b>
<b>TOTAL</b>	<b>\$1.70</b>	<b>\$1.72</b>	<b>\$1.32</b>	<b>\$1.46</b>

## **Conclusion**

The results indicate that fat reduction in confectionery products is possible when using dried plums. And, fat reduction can be achieved without any loss of flavor or other sensory characteristics. A one-third fat reduction to reach reduced-fat status (low-fat for the uncoated cereal bar) for labeling is considered significant. Significant also, is the ingredient cost reduction when using dried plums.

Thus, confectioners now have the opportunity to participate in the growing category of low- and reduced-fat foods by offering great tasting indulgence products that also satisfy consumer demand for less fat.