

# The role of red raspberries in today's market

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Each year the food industry discovers new revelations about the health benefits of a particular ingredient and this year, red raspberries are topping the list for providing flavour with function. As new, promising information continues to emerge about the cancer-fighting benefits of ellagic acid found in red raspberries, manufacturers are looking for new ways to incorporate this attractive, versatile fruit into a range of new, healthy food products.

## **Functional Foods**

With all of the new healthy and functional food products being launched throughout the world, one has to wonder how consumers survived for all those years! Health is, undoubtedly, the direction of the world's food industry. For the past several years, a common factor in many successful food product introductions has been functional health. These are not products that are just sugar-free, caffeine-free, sodium-free, low-calorie, low-fat, high-fibre cereals, or naturally sweetened; the market still has those. Functional foods are providing consumers with specific "antidotes" to human sickness: antioxidants to fight cancer; l-arginine for fighting coronary artery disease; and calcium fortification for fighting osteoporosis. It's a wonder consumers don't need a prescription for some of the products being launched on the market.

## **Red Raspberries and Functional Foods**

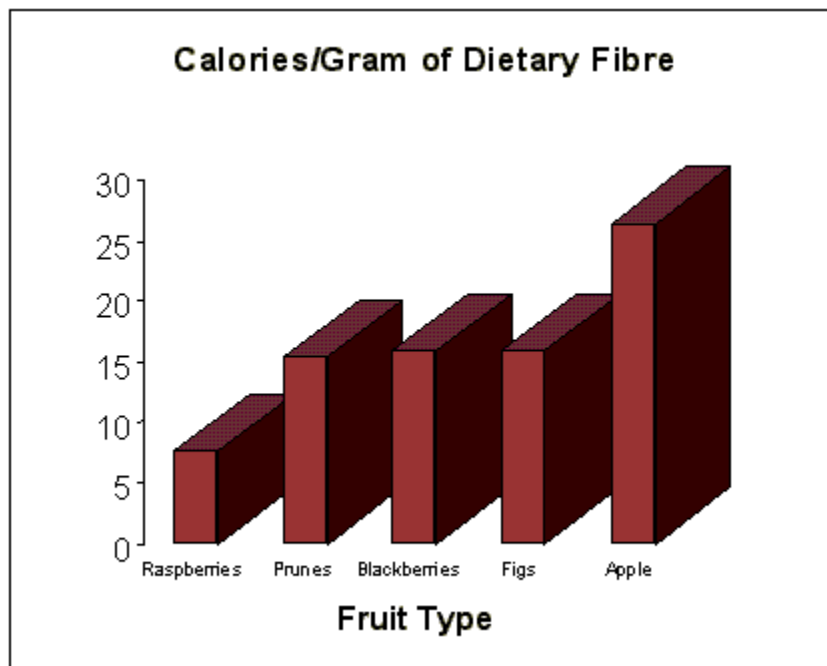
Red raspberries have made their way into a wide variety of functional foods because of the nutritional, functional and technical advantages they provide manufacturers. Red raspberries are sold fresh, individually quick frozen (IQF), block frozen, as frozen puree, and in various levels of concentrations of juice and purees. The many forms in which red raspberries can be used offer manufacturers a great deal of flexibility in new product formulation. Also, given today's leading market trends for health, nutrition, convenience, and natural ingredients, red raspberries match market demands on several levels.

## **Red Raspberry Nutrition**

Raspberries provide the most dietary fibre with the fewest calories compared to other fruits: only 7.69 calories/gram of dietary fibre. Because increased intake of dietary fibre has been proven to reduce the risk of colon cancer and heart disease, it is important to include fibre in the diet as efficiently as possible.

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<b>Raspberries</b>		
	1 cup unsweetened	2/3 cup frozen / sweetened
<b>Calories</b>	61	103
<b>Fat</b>	0.7 g	0.2 g
<b>Cholesterol</b>	0	0
<b>Protein</b>	1.1 g	0.7 g
<b>Fibre</b>	3.7 g	2.2 g
<b>Vitamin C</b>	31 mg	17 mg
<b>Vitamin B2</b>	0.11 mg	0.05 mg
<b>Vitamin B6</b>	0.07 mg	0.03 mg



## Ellagic Acid

The most promising benefit that red raspberries hold for consumers is their substantial quantity of ellagic acid. Ellagic acid is a phenolic compound that has become known as a potent anti-carcinogenic/anti-mutagenic compound. Clinical tests conducted at the Hollings Cancer Institute at the Medical University of South Carolina (MUSC) show that ellagic acid, a naturally occurring plant phenol, may provide a potent mechanism to prevent cancer, inhibit the growth of cancer cells, and arrest the growth of cancer in subjects with a genetic predisposition for the disease. Dr. Daniel Nixon, MUSC, began studying ellagic acid in 1993. His recently published results show:

- cervical Cancer Cells - HPV (human papilloma virus) exposed to ellagic acid experienced apoptosis (normal cell death);
- ellagic acid leads to G1 arrest of cancer cells, thus inhibiting and stopping mitosis (cancer cell

- division);
- ellagic acid prevents destruction of the P53 gene by cancer cells. P53 is regarded as the safeguard of mutagenic activity in cervical cells;
  - tests reveal similar results for breast, pancreas, oesophageal, skin, colon, and prostate cancer cells.

The Meeker red raspberry is the best source of ellagic acid followed by Chilliwack and Willamette. The Meeker variety is specific to the Pacific Northwest and is grown primarily for commercial use in Washington State. The Chilliwack and Willamette varieties contain lesser variations of ellagic acid. Both of these varieties are grown in the Pacific Northwest and may be found in lesser volumes outside the United States.

<b>Ellagic acid (micrograms/gram dry weight)</b>			
<b>Fruit Variety</b>	<b>Seeds</b>	<b>Pulp</b>	<b>Whole</b>
Meeker	8.40	3.36	4.31
Chilliwack	7.78	2.58	3.39
Willamette	8.13	2.05	2.91
Average	8.10	2.66	3.54

Over 125 different research papers exist regarding the efficacy of ellagic acid when it comes to fighting the growth of cancer cells. A complete list of all these references along with abstracts of the findings is available at <http://www.red-raspberry.org>.

### **How does ellagic acid work?**

Ellagic acid acts as a scavenger to "bind" cancer-causing chemicals, making them inactive. It inhibits the ability of other chemicals to cause mutations in bacteria. In addition, ellagic acid from red raspberries prevents binding of carcinogens to DNA, and reduces the incidence of cancer in cultured human cells exposed to carcinogens.

### **Technical Advantages**

However, it is certainly not just the healthy benefits of red raspberries that make them appealing for use in food products. The technical advantages of red raspberries, such as their use as natural colourants, as a flavouring, and as a natural juice sweetener, mean they play a key role in the many new red raspberry products introduced around the world each year.

There are many examples of new products that capitalize on the flavour, colour and sweetness of red raspberries. In the first eight months of this year, over 50 new products were introduced containing red raspberries in some form. Examples include *Breyer's Raspberry Cobbler Ice Cream* (**Good Humor-Breyers: Green Bay, Wisconsin**) and *Simply Nutritious St. John's Peach Berry with Raspberry*; (**R.W. Knudsen, Chico, California**) Solana Gold Organics (**Sebastopol, California**) has recently introduced their *Organic Apple Sauce Extensions with Raspberry* to take advantage of the rapidly growing market for organic products. Manufacturers incorporate red raspberries for visual appeal, taste, nutrition, and their upscale image.

The versatility of red raspberries is provided by the variety of forms in which they are processed and sold. The following is a description of several of the more popular ways to use red raspberries.

## **Block Frozen Red Raspberries**

Block frozen red raspberries are frozen in their own juice. Cleaned, sorted, and graded berries are packed in plastic or metal pails. Standard block frozen container weights are 6.5 lb. (2.925kg) and 28/30 lb. (12.6/13.5kg). Institutional packs are also available in 400 lb. (180kg) drums lined with 2-4 mil plastic bagging. Block frozen red raspberries may be purchased with or without sugar sweetening, or syrup. Raspberries that are block frozen without sugar are referred to as "straight pack." Block frozen raspberries with sugar or syrup sweetening combinations are available in ratios of 4+1 (4 parts red raspberries to 1 part sugar), or more if needed.

## **Individually Quick Frozen (IQF) Red Raspberries**

These are the choicest whole frozen raspberries. "Individual" raspberries are frozen in a quick freeze tunnel or on trays at temperatures between -5° to -10° Fahrenheit (-20 to -23° Celsius). This "quick freezing" seals in juices and maintains the original shape of each berry. IQF red raspberries are packed in poly bags and sealed in corrugated fibre cartons. This ensures that each IQF red raspberry is "fresh frozen" and protected from damage or shipping shock. IQF red raspberry packs are available in 12-ounce (336g), 16-ounce (448g), and 32-ounce (869g) poly bags for retail sale, and 30 lb. (13.5 kg) cartons. Restaurant, institutional, and foodservice cases containing six, 5 lb. (2.25kg) IQF packages are also available.

## **Frozen Red Raspberry Puree**

Red raspberry puree is produced by passing cleaned and sorted berries through a sieve to achieve a consistent particle size. Screen meshes from 0.03 to 0.125 inches determine the fineness of puree and the amount of seed removed. Red raspberry puree may be processed at ambient temperatures or heated for pasteurization. Puree of red raspberries is frozen at -5° to -10° Fahrenheit (-20 to -23° Celsius). The most common puree packs are 6.5 lb. (2.925 kg) and 28 lb. (12.6 kg) containers and 400 lb. (180 kg) drums. Puree may be custom packed in quart and gallon equivalents. Puree is also available in concentrated form.

## **Red Raspberry Concentrate**

Concentrate is an intense capture of both red raspberry essence and form. Red raspberry juice is first extracted from the fruit. This juice is filtered and heated. High temperature allows the flavour and aroma (called "essence") to be distilled from the concentrate. The essence is captured in liquid form and may be packed separately or mixed back into the concentrate (called "recapture"). Red raspberry concentrate is specified in Brix. Degrees Brix describe the approximate percent of sugar or soluble solids. Single-strength juice may be concentrated to a maximum level of 60-65° Brix. Red raspberry concentrates are packed in 50 gallon (190 litre) drums and 5 gallon (19 litre) enamel-lined cans, or 4,5, and 6 lb. (1.8, 2.25, and 2.7 kg) poly-lined pails with essence packed separately or recaptured.

### **Red Raspberry Product Form Specifications**

**Single Strength Puree** 8° to 15° Brix

**Puree Concentrate** 20° to 28° Brix

**Single Strength Juice** 9.2° Brix

## **Washington Red Raspberry Committee (WRRC)**

The Washington Red Raspberry Committee provides all the necessary technical information to manufacturers and members of the food industry who use red raspberries in their products. For product ideas, formulations, or to obtain assistance, you can contact the WRRC at:

Washington Red Raspberry Commission,  
1751 Front Street,  
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