

## Cranberry Juice: Summary of Composition Findings and Current Research

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Two main classes of “pure cranberry juice” products were found in composition data from various sources.

1. Cranberry juice made by pressing and bottling without being concentrated (this class of product appears to be available on the consumer market only in Canada).
2. Cranberry juice made by reconstitution from a concentrated product. This class of product appears to primarily be made from a frozen concentrate made available to food industry manufacturers by Ocean Spray – see <http://www.oceansprayitg.com/products/concentrate.htm> for links to further information, specifications and nutritional information about this concentrate (as well as a puree product).

Both products are typically used by consumers by diluting the “pure juice” with water or other juices/drink products in a ratio of 5 or 6 parts other liquid to one part “pure juice”. This results in a concentration approximately equivalent to that found in bottled cranberry cocktails. Use of this “pure cranberry juice” type of product allows consumers to have complete control over the degree of sweetening added to their cranberry-based drinks. The information given below pertains to the “pure cranberry juice” products prior to dilution with water or other liquids by consumers, reflecting only sugars that are naturally present in “single strength” cranberry juice. A number of dietitians reported that they consider unsweetened cranberry juice to be low enough in natural sugars to be a “free” food for diabetics when used in moderation.

Elen Castleberry, Manager of Research and Development at J.M. Smucker, stated:

“Every juice has a standard of identity which uses soluble sugars as the measurement.

Cranberry has a single strength brix value for 100% juice of 7.5 brix.”

She also reported that all fruit (including cranberries) must have water added to process into juice. This would dilute the sugar concentration below the 7.5 brix value of standard identity for cranberry. The water added during the juice-extracting process would be removed by subsequent processes used to produce a pure juice concentrate. However, in the case of “pure juice” products sold to consumers as having not been made from reconstituted concentrate, the additional juice-processing water would not be removed. This would result in sugar (and very likely other nutrient) values less than that found in products that have been reconstituted from concentrate to the 7.5 brix standard of single-strength pure cranberry juice. This would explain the difference in total CHO reported by the following two companies which market 100% pure unsweetened cranberry juice:

1. Black River, a Canadian company that does not use cranberry juice concentrate as its product base, reports 5.2g CHO/100mL
2. Knudsen Juices, an American company that reconstitutes cranberry juice concentrate for its “Just Cranberry” product, reports 5.9g CHO/100mL

An article written by Marge Leahy, senior nutritionist at Ocean Spray, which appeared in Nutrition Today, Vol. 36, No. 5, 2001, pp. 254-65 reported that pure cranberry juice with a ratio of 95% water and 5% solids had a total CHO content of 4.7g/100g and total sugars of 3.6g/100g. These values appear lower than other reports that do not indicate the % breakdown between water and solids. It could be speculated from this discrepancy in reported data that the degree of filtration of sediment could affect the total CHO and sugar values of pure cranberry juice. It may also be indicative of the amount of water added during the juice pressing process.

A study published by Hong & Wrolstad in the Journal of the Association of Official Analytical Chemists, 69(2): 199-207 (1986) examined 8 samples of pure cranberry juice pressed from frozen cranberries of various varieties. The degree brix values of the samples ranged from 6.5 to 8.7 (with a mean value of 7.9, slightly higher than the 7.5 brix “standard” value indicated above).

The USDA jelly standard for cranberries (versus cranberry juice) is 10.5 brix. [Author's note: this may indicate that the sugars present in cranberries adhere to some degree to the solids removed by filtration in the pressing process of cranberries into juice.] This study reported total sugars in single strength cranberry juice ranging from 4.8-6.4g/100g (average of 5.4g/100g), glucose ranging from 3.7-5.0g/100g (average of 4.3g/100g), fructose ranging from 0.9-1.5g/100g (average of 1.1g/100g), and a glucose:fructose ratio ranging from 3.1-4.8 (average of 3.8).

In a similar 1977 study published by Schmid in Acta Hort., 61, 241-254 (1977), similar results were found by analyzing 12 cranberry samples, although the range in glucose:fructose ratio was greater. This study reported total sugars in single strength cranberry juice ranging from 5.25-7.3g/100g (average of 6.10g/100g), and a glucose:fructose ratio ranging from 2.27-5.20 (average of 3.09). Schmid speculated that degree of ripeness of the cranberries (which is difficult to judge visually) may have contributed to the degree of variability of this ratio.

### **Some Interesting Research Pertaining to Unsweetened Cranberry Juice and Diabetes**

Mary Ellen Camire, Ph.D., a professor in the Dept. of Food Science & Human Nutrition at the University of Maine, will be presenting some findings at Experimental Biology in April 2002 which indicate that cranberry juice may lower blood sugar and blood lipid levels for adults with Type II diabetes. Although this is just one study, I might add from a personal perspective that these findings appear to be supported by my father's experience in using 30 mL/day of pure unsweetened cranberry juice as part of my mother's tube feeding routine. Due to the fact that my mother is not mobile and is exclusively tube-fed through a G-Tube, her diet and metabolic rate are much more constant than most people. Upon discharge from hospital to stabilize newly developed Type II diabetes, my father has varied her diet (not her dosages of insulin and metformin) only by introducing the use of the cranberry juice. Blood lipid levels have not been measured yet since discharge (no medications have been prescribed as yet for this either), but glucometer readings performed by my father appear to be holding steady or show a downward trend. This is welcome news to my father, since prior to development of diabetes, he relied heavily on this regimen of pure cranberry juice to prevent urinary tract infections in my mother.