

## Sugars and Traditional Dried Fruits: No Reason for Concern



**Few issues in nutrition generate more scientific controversy and consumer confusion than the association between sugar and health. Traditional dried fruits are nutrient dense, with no added sugar and like all fruits and vegetables, can contribute to health. As a source of natural sugar in the diet, given current media interest in sugar reduction, do we have reason for concern?**

*Dr. Arianna Carughi advises California agricultural boards, Sun-Maid Growers of California and food, nutrition and wellness industries.*

*Jennette Higgs, RD RNutr provides nutrition consultancy services in EU for Dried Fruit and Nut Industries.*

### **Intrinsic sugars not “free sugars”**

Sugars in dried fruit are considered intrinsic: those sugars incorporated in the structure of intact cells. Drying fruit retains the cellular matrix of the fruit tissue and simply removes a portion of the fruit’s water, so concentrating their natural sugar. This is normalized by smaller serving sizes. Per fruit, they have no more sugar (or energy) than their fresh counterpart. Traditional dried fruit includes prunes, raisins, dried apricots, peaches and figs; plus dates, even though most varieties are “fresh” with naturally low moisture. Nothing is added to these fruit that alters their nutritional value.

### **Intrinsic sugars recommended over free or added sugars**

While the terminology used to describe sugars is inconsistent (Table 1) and health organizations have set different upper limits of sugar consumption (Table 2), all stress the importance of reducing intake of foods with *added* sugars and encourage foods with intrinsic sugars.

Minimally processed, traditional dried fruits retain most of the nutritional properties of their fresh counterparts and so are included within the World Health Organization (W.H.O.) definition of “fruit”<sup>[1]</sup>, as in the U.S. UK, Argentina, Canada, France, Germany, Italy, and Sweden among others.<sup>[2]</sup> Likewise they can count towards achieving targets such as the UK’s 5-a-day scheme.

**Table 1. Terminology used to describe sugars**

<b>Total sugars</b> <sup>[3]</sup> <sup>6</sup>	All mono and disaccharides (glucose, fructose, lactose, sucrose, maltose). Includes naturally occurring sugars as well as those added to a food or drink.
<b>Free sugars (WHO and SACN)</b> <sup>[4]</sup> <sup>[5]</sup>	Sugars (monosaccharides and disaccharides) added to foods and drinks by the manufacturer, cook, or consumer, and sugars naturally present in honey, syrups, fruit juices, and fruit juice concentrates (includes nectars).
<b>Added sugars (EFSA)</b> <sup>[6]</sup>	Eaten separately or used as ingredients in processed or prepared foods (such as sucrose -white sugar, brown sugar, raw sugar, fructose, glucose, starch hydrolysates and other isolated sugar preparations- corn syrup, corn syrup solids, high-fructose corn syrup, malt syrup, maple syrup, pancake syrup, fructose sweetener, liquid fructose, honey, molasses.)
<b>Added sugar (FDA, USA)</b> <sup>[7]</sup>	Any sugar added during the processing of foods or consumed separately (sugars, syrups, naturally-occurring sugars that are isolated from a whole food and concentrated so that sugar is the primary component [e.g., fruit juice concentrates], other caloric sweeteners)
<b>Intrinsic sugars (WHO and SACN)</b> <sup>6</sup> <sup>7</sup>	Sugars naturally incorporated in the structure of intact fruits and vegetables;sugars from milk (lactose and galactose)

**Table 2. Summary of Key recommendations for added (free) sugar intake**

<b>Organizations</b>	<b>Recommendation</b>
<b>WHO</b> <sup>6</sup>	10 % total energy; suggested a further reduction to below 5% calories for additional health benefits
<b>SACN (UK)</b> <sup>7</sup>	5 % total energy; redefined in 2015 and reduced from 10% (previously “non-milk extrinsic sugars”)
<b>American Heart Association (AHA)</b> <sup>[8]</sup>	5% total energy
<b>Dietary Guidelines for Americans 2015 (USA)</b> <sup>2</sup>	10% total energy
<b>European Food Safety Administration (EFSA)</b> <sup>8</sup>	25% total energy

**How do intrinsic and added or free sugars differ?**

Added sugars are chemically identical to sugar that naturally occurs in foods. No analytical

laboratory method can distinguish them and the body processes both sugar sources similarly. Differences occur however physiologically. Entrapped in the plant food matrix, release of intrinsic sugars in the gut is slowed down, blood glucose moderated and insulin response lowered. For this reason studies actually show that traditional dried fruits have a low to moderate glycemic index and a glycemic response comparable to fresh fruits.[\[9\]](#) [\[10\]](#) This appears to be due to the presence of fiber, organic sugars, and polyphenols that can modify the response.[\[11\]](#) [\[12\]](#) [\[13\]](#) [\[14\]](#) Moreover, a study comparing the glycemic response to 100 calorie servings of dried and fresh fruit showed no difference in peak sugar levels.<sup>16</sup> The glycemic index is a measure of how a food affects blood sugar levels. Foods with a low glycemic index may help to decrease the risk of diabetes and are useful in its management.

### **Dried fruits: a wealth of nutrients**

Of concern to health organizations is that a high intake of foods containing added sugars displaces the intake of nutrient dense foods, thereby compromising nutrient intakes. All fruits and vegetables, including traditional dried fruits are nutrient dense, providing essential nutrients that may be lacking in today's diets such as fiber and potassium. Modeling research undertaken by the British Nutrition Foundation concludes that achieving recommended daily fibre intakes (30g fibre/day for adults)<sup>7</sup> is difficult, even when following dietary guidelines. To do so requires around 8 portions/day of fruit and vegetables, with fibre-rich snacks (e.g. seeds, nuts and dried fruit) and other high-fibre foods (e.g. pulses) included in the diet[\[15\]](#).

Dried fruits also provide vitamin A (apricot and peaches), calcium (figs), vitamin K (prunes), boron (raisins and prunes), iron (apricots and peaches) and copper (all), as well as an array of health protective bioactive compounds including carotenoids, flavonoids and phenolic acids, pectins and fructo-oligosaccharides. Devoid of fat and very low in salt (sodium),[\[16\]](#) epidemiologic studies have found an association between dried fruit consumption and improved diet quality.[\[17\]](#)

### **Dried Fruit and Dental Health**

Concerns about adverse effects of dried fruit on dental health have led to restrictive advice around consumption as a between-meal snack, to reduce the impact on teeth[\[18\]](#). A recent literature review of research around dried fruit and dental health concludes that the common perceptions that dried fruits are "sticky", adhere to teeth, and are detrimental to dental health because of their sugar content are based on weak evidence; and that there is a lack of good quality scientific data to substantiate such restrictive advice. The review also highlights for consideration several characteristics of dried fruits that could in part mitigate potential detrimental dental effects: relatively high levels of sorbitol, which contribute to the maintenance of tooth mineralization; their chewy texture and taste which might help to promote the flow of saliva; and their polyphenol content with potential anti-bacterial properties[\[19\]](#). Whilst more research is recommended, common sense would suggest that restricting nutrient dense dried fruit snacking in favour of typical carbohydrate snacks (e.g. crisps, biscuits), that have been shown to be more retentive to teeth than dried fruit is absurd[\[20\]](#). If reducing sugars is the aim, then reducing intake of less nutritious sources of sugar should be the focus.

Traditional dried fruits are simply fresh fruit with water removed. Their unique combination of taste, aroma and nutritional value, offer a convenient step towards healthier eating, bridging the gap between recommended intake of fruits and actual consumption. It's time to put the *traditional* back onto dried fruit and preserve their historical place as an integral part of healthy dietary patterns around the world, through factually correct, proactive communications in defense of nature's own sweets!

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[1] Agudo A. Measuring Intake of Fruits and Vegetables, World Health Organization (WHO): 2005 [http://www.who.int/dietphysicalactivity/publications/f&v\\_intake\\_measurement.pdf](http://www.who.int/dietphysicalactivity/publications/f&v_intake_measurement.pdf)

[2] <http://www.fao.org/nutrition/education/food-dietary-guidelines/regions/>

[3] Hess J, Latullipe ME, Ayoob K, Slavin J. The confusing world of dietary sugars: Definitions, intakes, food sources and international dietary recommendations Food Funct., 2012, 3, 477

[4] World Health Organization (WHO) Guideline: Sugars Intake for Adults and Children. World Health Organization (WHO); Geneva, Switzerland: 2015.

[5] Scientific Advisory Committee on Nutrition (SACN) Carbohydrates and Health. Public Health England; London, UK: 2015

[6] European Food Safety Authority (EFSA) Scientific opinion on dietary reference values for carbohydrates and dietary fibre. EFSA J. 2010;8. doi: 10.2903/j.efsa.2010.1462

[7] Food and Drug Administration (FDA) Changes to the Nutrition Facts Label <https://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/Labeling/Nutrition/ucm385663.htm>

[8] <http://circ.ahajournals.org/content/circulationaha/120/11/1011.full.pdf>

[9] Foster-Powell K, Holt SHA., and Brand-Miller JC. "International Table of Glycemic Index and Glycemic Load Values: 2002." Amer J of Clin Nutr 2002; 76:5–56

[10] JA Anderson, HA Huth, MM Larson, AJ Colby, EJ Krieg, LP Golbach, KA Simon, SL Wasmundt, CJ Malone, T Wilson. Glycemic and Insulin Response to Raisins, Grapes and Bananas in College Aged Students FASEB Journal. 2011; In Press Abstract #6161

[11] Esfahani A, Lam J, Kendall CM> Acute effects of raisins consumption on glucose and insulin responses in healthy individuals. J Nutr Sci 2014;3:e1

[12] Johnston KL, Clifford MN, Morgan LM Coffee acutely modifies gastrointestinal hormone secretion and glucose tolerance in humans: glycemic effects of chlorogenic acid and caffeine. Am J Clin Nutr 2003; 78: 728-33

[13] Björck I, Elmståhl HL. The glycaemic index: importance of dietary fibre and other food properties. Proc Nutr Soc. 2003 Feb; 62(1):201-6.

[14] Widanagamage RD, Ekanayake S, Welihinda J. Carbohydrate-rich foods: glycaemic indices and the effect of constituent macronutrients. Int J Food Sci Nutr 2009;60 Suppl 4:215-23

[15] Hooper B, Spiro A, Stanner S (2015) 30 g of fibre a day: An achievable recommendation? Nutrition Bulletin. 40; 118-129.

[16] Alasalvar C. and Shahidi, F. Composition, Phytochemicals, and beneficial health effects of dried fruits: An Overview. In: *Dried fruits: Phytochemicals and Health Effects*. Wiley-Blackwell, 2013, Oxford, U.K. pp 1-18

[17] Keast DR, O'Neil CE and Jones JM. Dried fruit consumption is associated with improved diet quality and reduced obesity in US adults: National Health and Nutrition Examination Survey, 1999-2004. *Nutr Res* 2011; 31(6):460-7

[18] <http://www.nhs.uk/Livewell/5ADAY/Pages/Whatcounts.aspx>

[19] <http://www.tandfonline.com/doi/full/10.1080/09637486.2016.1207061>

[20] Kashket S, Van Houte J, Lopez LR, Stocks S (1991) Lack of correlation between food retention on the human dentition and consumer perception of food stickiness. *J Dent Res*. 70(10): 1314-1319