INTERNATIONAL FEDERATION
OF FRUIT JUICE PRODUCERS

FÉDÉRATION INTERNATIONALE DES
PRODUCTEURS DE JUS DE FRUITS

INTERNATIONALE
FRUCHTSAFT-UNION

23, BD DES CAPUCINES – F 75002
PARIS
e-mail: ifu@ifu-fruitjuice.com
http://www.ifu-fruitjuice.com

Tel : +33 (0) 1 47 42 82 80
Fax : + 33 (0) 1 47 42 82 81

FRUIT JUICE NUTRITION POLICY
(IFU position paper)

(3-11-2005)

The Global Focus

Governments throughout the World advocate the inclusion of fruit juices♦ in a healthy diet. A juice, that is 100% derived from its parent fruit or fruits, is almost universally regarded as a healthy and nutritious part of a human diet. The World Health Organisation (WHO) is a co-sponsor of the global 5+ a day programme. This programme promotes the inclusion of at least five portions a day of fruit and vegetables as an essential element in a healthy diet.

The consumption of a portion of a fruit juice is clearly embedded in the detailed recommendations for increased consumption of fruit and vegetables in the 5+ a day strategy.[3]

The 2004 5+ a day symposium was attended by representatives from 31 countries. Many of these countries have implemented the 5+ a day recommendations, including the USA, Canada, Australia and New Zealand, Brazil, South Africa, Malaysia, Mexico, Vanuatu and Norway[2], alongside fourteen of the EU Member States. Furthermore, this is an integral part of the World Cancer Research Fund (WCRF) drive to reduce the incidence of cancer. The organisation has made the following statements:

"The 5+ a day message is one of the most successful health promotion ideas to reach the global community" *and* "research has shown that eating at least five portions of vegetables and fruits each day could, in itself, reduce cancer rates by 20%."[1]

Fruit and Fruit Juice

The main emphasis in health promoting dietary recommendations is the increased consumption of fruit and vegetables. According to the CODEX General Standard for Fruit Juices and Nectars "*fruit juices have the essential physical, chemical, organoleptical, and nutritional characteristics of the fruit(s) from which it comes" .* Juices are more convenient to consume, and have in general a longer shelf-life than fresh fruit. Therefore, moderate intake of juices along with fruit is deemed to be completely appropriate by the 5+ a day programme.

♦ Vegetable juices are assumed to be within the term 'fruit juice' and their properties are referred to without distinguishing them as a vegetable source of juice.

Fruit juice and health and disease reduction

Fruit juices contain a complex mixture of nutrients which are beneficial to the maintenance of good health and they have intrinsic disease risk reduction properties. In addition to the major nutrients (e.g., vitamins, minerals) that are inherent in the fruit itself, juices also contain phytochemicals (often referred to as phytonutrients) that are derived from the fruit. Phytochemicals are thought to act as antioxidants[▽], stimulating the immune system, positively affecting hormones, and acting as antibacterial / antiviral agents and more. Multitudes of research studies are now finding that these natural bioactive compounds seem to work alone or in conjunction with the fruit's vitamins and minerals to maintain and promote good health.

The scientific literature contains many references to the disease risk reduction properties of components of fruit, vegetables and their juices.

Although the list is too long to include here, some of the many beneficial effects for the major fruit juices are noted below:-

- Citrus juice provides sufficient vitamin C to be a major proportion of the Daily values[36]
- Grape juice and tomato juice are rich sources of antioxidants[▽] (polyphenolics and lycopene respectively) [4,5]
- The polyphenolics in grape juice have shown a positive effect on parameters related to cardiovascular disease [6,7]
- Jaffa 'Sweetie' grapefruit juice contains antioxidants which have a marked positive effect on indicators relating to hypercholesterolemia[25]
- Orange, grapefruit and pineapple juice contain a significant quantity of folate which renders them effective in countering the risk of neural tube defects e.g. *spina bifida* [4].
- Cranberry juice has long been associated with a reduction in urinary infections[8].
- Phytochemicals found in apples and apple juice have been associated with reduced risk of impaired lung function.[11]
- Diets rich in potassium may help to maintain healthy blood pressure. Fruit sources of potassium include prunes and prune juice, orange juice, bananas, dried peaches and apricots, cantaloupe and honeydew melon.[12]

A recent report from a UK Government funded research organisation observed the low frequency of intake of fruit and vegetables in childrens' diets. The report went on to recommend that children should be offered rations of orange juice from concentrate (and cod liver oil)[33] as in the forties of the previous century. The USA, Canada, Newfoundland [34] and the UK, all offered these products to children and infants, in this period, because it was seen, by the health authorities, and governments, as an absolutely essential strategy to ensure the health of those nations. In the USA orange juice was offered to children free during the 1920s[35].

[▽] Antioxidants reduce the load of free radicals in the body, which are intimately involved in cellular damage - the common pathway for cancer, ageing, and a variety of diseases, including cardiovascular disorders [5,6]

Fruit juices and the topic of sugar

Excessive consumption of any carbohydrate is likely to lead to people being overweight. Concern has been expressed by some nutritionists that the natural sugar content in fruit juices can contribute to obesity, especially for children. Although there have been a few studies which evaluate the body weight and a possible association with consumption of fruit juice among children, the results are contradictory, with the results weighing on the side of there being no connection [15,16,17,18]

Consumption of fruit juice among children in the U.S.A., particularly has been a focus, even though government databases show that the average (mean) consumption is appropriate and within guidelines established by the American Academy of Pediatrics.

Mean daily consumption by the largest consuming group – children between the ages of 1 – 3 years – is 5.5 ounces (156 g) per day.[19]

Similarly, in the EU the average consumption of juice is less than 20 litres/capita/year which is well below the 5+ a day recommendation. In the developing countries, however, the level of consumption is even lower. This clearly demonstrates that there is not an excessive consumption of juices.

Additionally, the Glycaemic Index (GI) concept has led to a reassessment of the role of natural sugars in juices within the diet. The GI is the ranking of foods based on their overall effect on blood glucose levels. Slowly absorbed foods have a low GI rating whilst foods that are more quickly absorbed will have a higher rating. This is important, because foods with a low GI index are more satiating than those with a high GI, therefore, less of the food is ingested. This is also significant for people with diabetes because the GI enables them to choose slowly absorbed carbohydrates which helps in the control of blood glucose levels. Work in this area has shown that the many juices, such as orange, apple, pineapple, grapefruit, tomato and carrot have low GI values. [20,21]

There is strong evidence that the consumption of low GI foods assists in weight control as expressed in numerous scientific publications, some extracts of which are quoted below:-

“There are also benefits for weight loss. Low GI foods can help you control your appetite by making you feel fuller for longer, with the result you eat less”[22]

“The child’s appetite is the true guide to total CHO intake and insulin distribution. GI is a way to assist appetite control and postprandial glucose curves, which is especially relevant at night”[23]

“First, there is emerging evidence of the possible protective effect of low GI diets for both diabetes and heart disease. Second, slower digestion of carbohydrate is associated with higher satiety, so low GI diets may help with weight control”[24]

“However results of short-term studies on appetite regulation or weight loss suggest that low GI diets may be useful in promoting long-term weight loss and decreasing the prevalence of obesity.”[25]

The GI has largely unrecognised implications for weight control. In many studies, slow digestion of carbohydrate is associated with higher satiety. [26,27]

In Table 7, page 63 of WHO Report 916 “Diet, Nutrition and The Prevention of Chronic Diseases” it indicates that there is initial evidence that low glycaemic index foods protect against weight gain and obesity.

Fruit juices and dental health

Diet, in the past, has played a crucial role in the development of dental caries and erosion. With the advent of the use of fluoride, the role of diet has assumed subsidiary importance. Dr. Van Loveren of the Academic Centre for Dentistry, Amsterdam goes as far as stating that if these oral hygiene factors combined with the use of fluoride are adequate, then diet is of little importance.[28] Dr. Konig of the University Medical Faculty, Preventive and Community Dentistry, Nijmegen also argues cogently for this view when he says that "there is no need for population based dietary guide-lines for sugar intake with regard to dental health, providing fluoride intake is adequate, and there is good oral hygiene".[29]It has been observed from a large number of studies carried out within the last 20 years that there is only a weak correlation or no correlation between sugar consumption and caries incidence.[28] The steep rise in the numbers of caries-free children occurred when fluoride became available. During that period sugar consumption was continuously high.[28]

There is a commonly expressed view that eating whole fruit is not as harmful to teeth as consuming fruit juices.[30]This view has been countered recently by dental experts from London, who have established experimentally, that there is no difference in the amount of sugar and acid generated in the saliva between raw whole fruit and fruit that had been pulped prior to ingestion.[31]

When it comes to dental health, good dental hygiene practices of brushing and flossing regularly will help keep teeth in good health. According to the U.S. National Center for Chronic Disease Prevention and Health Promotion, tooth decay continues to decline among Americans, including young children.[32]

Conclusion

It can be quite clearly demonstrated, both historically and currently, that fruit juices, within a balanced diet, offer both health and disease risk reduction properties. A moderate intake of any food product is appropriate for any person in good health – there is no such thing as a bad food, only bad diets. Furthermore, to identify fruit juices as inadvisable in the context of obesity and dental health, would deny the consumer a perfectly healthy and nutritious food, and be completely contrary to the evidence noted in this document. It is, therefore true to say that fruit juice has a long and distinguished pedigree for being regarded as an essential part of a healthy diet.

REFERENCES

1. World Cancer Research Fund
   http://www.wcrf.org/campaign/5_a_day.lasso

2. Highlights of the 4th 5+ a day Symposium, 2004
   http://www.5aday.co.nz/symposium/highlights.html

3. 5+ a day dietary recommendations
   http://www.5aday.com/html/consumers/faqs.php

4. Vinson JA, Teufel K, Wu N. (2001)Red wine, dealcoholized red wine and especially grape juice inhibit atherosclerosis in a hamster model. Atherosclerosis; 156(1):67-72.

5. Lycopene in tomato
   http://www.diagnose-me.com/treat/T356378.html

6. Folts JD. (2002) Potential health benefits from the flavonoids in grape products on vascular disease. Adv Exp Med Biol; 505:95-111.

7. Stein JH, Keevil JG, Wiebe DA, Aeschlimann S, and Folts JD. (1999) Purple grape juice improves endothelial function and reduces the susceptibility of LDL cholesterol to oxidation in patients with coronary heart disease. Circulation; 100(10):1050-1055.

8. Gorinstein S. (2004) Fresh Israeli Sweetie Juice consumption improves lipid metabolism and increases antioxidant capacity in hypocholesterolaemic patients suffering from coronary artery disease. J Agric Food Chem; 52, 5215-5222.

9. Folate and neural tube defects
   http://www.foodstandards.gov.au/mediareleasespublications/publications/evaluatingthefolateneuraltubedefecthealthclaimpilot/listoffoodsandfoodpr1040.cfm

10. Cranberry juice
    http://www.news-medical.net/?id=5187

11. Butland BK, Fehily AM, Elwood PC. (2000) Diet, Lung Function, and Lung Function Decline in a Cohort of 2512 Middle-aged Men. Thorax; 55:102-108.

12. United States Department of Agriculture. MyPyramid.gov
    http://www.pyramid.gov/pyramid/fruits_why.html

13. Antioxidants and free-radicals
http://www.rice.edu/~jenky/sports/antiox.html

14. Antioxidant in fruits
http://www.nottingham.ac.uk/biosciences/nutrbio/posters/pdf/antioxidants.pdf

15. Newby PK, Peterson KE, Berkey CS, Leppert J, Willett WC, Colditz GA. (2004) Beverage consumption is not associated with changes in weight and body mass index among low-income preschool children in North Dakota. J Am Diet Assoc; 104(7):1086-1094.

16. Skinner JD, Carruth BR. (2001) A longitudinal study of children's juice intake and growth: the juice controversy revisited. J Am Diet Assoc; 101: 432–437.

17. Skinner JD, Carruth BR, Moran J, Houck K, and Coletta F. (1999) Fruit Juice Intake Is Not Related to Children's Growth. Pediatrics January; 103:58-64.

18. Welsh JA, Cogswell ME, Rogers S, Rockett H, Mei Z, Grummer-Strawn LM. (2005)Overweight among low-income preschool children associated with the consumption of sweet drinks: Missouri, 1999-2002. Pediatrics; 115(2): e223-9.

19. Rampersaud GC, Bailey LB, Kauwell GP. (2003) National survey beverage consumption data for children and adolescents indicate the need to encourage a shift toward more nutritive beverages. J Am Diet Assoc; 103:97-100.

20. Foster-Powell K, Holt SA, Brand-Miller JC. (200l) International Table of Glycemic Index and Glycemic Load Values. Am J Clin Nutr; 76:5-56.

21. Rick Mendosa (2002) New International Table of Glycemic Index (GI) and Glycemic Load Values

22. Glycemic Index Diabetes Australia
www.diabetes.org.uk/faq/GI.htm

23. Draft Guidelines on the Management of Type 1 Diabetes in Children and Adolescents. Australian Paediatric Endocrine Group (APEG): Dietitians Association of Australia

24. Binns, Colin (2004) Dietary Guidelines for Older Australians: National Health and Medical Research Council

25. The Oregon State University Linus Pauling Institute. Glycemic Index and Glycemic Load
www.lpi.oregonstate.edu/infocenter/foods/grains/gigl.html

26. Holt S, Brand J, Soveny C, Hansky J, (2002) Relationship of Satiety to Postprandial Glycemic, Insulin and Cholecystokinin responses. Am J Clin Nutr; 76:281S-285S.

27. Holt S, Brand-Miller JC. Particle Size, Satiety and the Glycaemic Response
Eur J Clin Nutr 1994; 48:496-502.

28. Van Loveren C. (2001) Nutrition, diet and oral health in the 21st century. International Dental Journal; 51:399-406.

29. Konig KG.(2000) Diet and dental health. International Dental Journal; 50:162-174.

30. Sheiham, A. (2000) Dietary effects on dental diseases. Public Health Nutrition; (2B):569-91

31. Beighton D, Brailsford SR, Gilbert SC, Clark DT, Rao S, Wilkins JC, Tarelli E, Homer KA. (2004) Intra-oral acid production associated with eating whole or pulped raw fruits. Caries Research; 38:341-349.

32. National Center for Chronic Disease Prevention and Health Promotion
Centers for Disease Control and Prevention
http://www.cdc.gov/OralHealth/factsheets/nhanes_findings.htm

33. (2005) Schools need a dose of cod-liver oil ,The Times 02/03/05

34. (1996) Desperate Measures The Great Depression in Newfoundland and Labrador: Newfoundland and Labrador Adult Basic Education Social History Series
www.nald.ca/CLR/social/book4/book4.pdf

35. Fomon S.J. (2001) Infant Feeding in the 20th Century: Formula and Beikost Journal of Nutrition.*;131:409S-420S*

36. Florida Department of Citrus (2005) Citrus Reference Book