

# A Guide to Nutrient-Dense Beverages for Schools

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by Tonia Reinhard, MS, RD

## Introduction

The 2004 reauthorized Child Nutrition Act required schools to put in place wellness plans by the start of the 2006-2007 school year. In addition, some states have also drafted standards for the foods and beverages that can be offered in their schools. School wellness plans and state standards must evolve as new information comes to light and in an effort to be more in sync with the Dietary Guidelines for Americans. The Dietary Guidelines Advisory Committee intended for the Dietary Guidelines for Americans 2005 "to be a primary source of dietary health information for policymakers, nutrition educators, and health providers."<sup>1</sup>

The Dietary Guidelines highlight the importance of nutrient-dense foods and beverages. (Nutrient-Dense foods and beverages are those foods and beverages that contain significant amounts of vitamins and minerals and relatively few calories.) However, some states and schools have written policies that promote nutrient-dense foods, but not nutrient-dense beverages. Nutrient-dense beverages should be an integral part of food and beverage guidelines for schools. This guide will assist you in understanding the need for nutrient-dense (sometimes referred to as nutrient-rich) beverages, "nutrients of concern" and ultimately in identifying those beverages that are nutrient-dense and provide a positive impact on the diets of children in your school(s).

## Obesity and Nutritional Deficiencies

The Dietary Guidelines state that "many Americans consume more calories than they need without meeting recommended intakes for a number of nutrients. This circumstance means that most people need to choose meals and snacks that are high in nutrients, but low to moderate in energy (calorie) content; that is, meeting nutrient recommendations must go hand in hand with keeping calories under control. Doing so offers important benefits – normal growth and development of children, health promotion for people for all ages, and reduction of risk for a number of chronic diseases that are major health concerns."<sup>2</sup>

## American Kids' Diet Fall Short in Critical Nutrients

When selecting beverages, the focus should be on key nutrients identified by USDA and the Dietary Guidelines as lacking in the diets of children.

### Nutrients of Concern

According to the Dietary Guidelines, dietary intakes of the following nutrients may be low enough for concern:

Children and Adolescents: **calcium, potassium, fiber, magnesium and vitamin E**

- Calcium, potassium and fiber are extremely important because they are considered "functional nutrients". They go beyond basic nutrition and play a role in reducing the risk of diseases such as cardiovascular disease, cancer, diabetes and osteoporosis.
- Only 20% of children consume the recommended servings of fruit and vegetables, an important objective of Healthy People 2010 and chief among the nutrients contained in fruits and vegetables are vitamin C, **fiber** and **potassium**.<sup>3</sup>

## Calcium Deficiency

- Most children are consuming less than the recommended amount of **calcium**.
- Studies suggest that a 5% to 10% deficit in peak bone mass may result in 50% greater lifetime prevalence of hip fracture, a problem certain to worsen if steps are not taken to improve **calcium** intake among adolescents.<sup>4</sup>

### Percentage of Children in the U.S. Consuming Less Than the Recommended Amount of Calcium

Males & Females 4-8 years old	50%
Males 9-13 years old	75%
Males 14-18 years old	65%
Females 9-13 years old	90%
Females 14-18 years old	95%

*Source: Continuing Survey of Food Intake by Individuals (CSFII). National Academy Press Washington D.C., 1997*

## Lactose Intolerance

- Many children are lactose intolerant or simply refuse to drink milk
- Many ethnic groups have a high prevalence of Lactose Intolerance, so milk is not always an option.<sup>5</sup> The USDA encourages food component variations for ethnic reasons.<sup>6</sup> Providing alternative sources of calcium is particularly important for many minority groups.
- There are new lactose-free organic sources of **calcium** for beverages that have been proven to be absorbed as well as or better than the **calcium** in milk.

### Incidence of Lactose Intolerance in the U.S. by Race

Race	% With Lactose Intolerance
Caucasians	21%
Hispanic Americans	51%
African Americans	75%
Native Americans	80%
Asian Americans	90%

*Source: National Institutes of Health*

## Potassium

- Only 20% of children consume enough fruit and vegetables, which are a primary source of **potassium**, so other sources are needed.
- According to the Dietary Guidelines, African Americans have a particularly low intake of **potassium** and a high prevalence of elevated blood pressure and salt sensitivity. This population subgroup may especially benefit from increased dietary intake of **potassium**.<sup>7</sup>

## Fiber

- Only 20% of children consume enough fruit and vegetables, which are a primary source of **fiber**, so other sources are needed.
- Fiber may enhance satiety (feeling of fullness) and reduce energy intake.<sup>8</sup>
- Other mechanisms, beyond satiety, may be responsible for fiber's purported protection against weight gain.<sup>9</sup>
- Fiber helps the body manage blood sugar levels and reduces the need for insulin.

## Vitamin E

- In schools, few foods other than ready to eat fortified breakfast cereals, provide a significant amount of **vitamin E**, so other sources are needed.
- **Vitamin E** is an antioxidant that helps boost the immune system.<sup>10</sup>

## Other Important Nutrients

Since milk is a primary source of **vitamins A** and **D** and many children either can't or won't drink milk, these nutrients are also important additions to beverages formulated for school children.

## Vitamin A

- **Vitamin A** is an important nutrient required by FDA to be added to milk.
- Since many children either can't or won't drink milk and only 20% of children consume enough fruits and vegetables, other sources of **vitamin A** are needed.
- Lack of **vitamin A** can lead to poor eyesight or blindness.

## Vitamin D

- **Vitamin D** is an important nutrient required by FDA to be added to milk.
- The main function of **vitamin D** is in building bone; one of the ways is in increasing the absorption of **calcium**.<sup>10</sup>
- Studies suggest that higher levels of **vitamin D** are associated with a lower risk for developing multiple sclerosis and that this inverse relationship is particularly strong before age 20 years.<sup>11</sup>
- Vitamin D deficiency plays a role in increasing the risk of many common and serious diseases, including some common cancers, type 1 diabetes, cardiovascular disease, and osteoporosis.<sup>12</sup>
- Since the primary source of **vitamin D** is milk and many children either can't or won't drink milk, other sources of **vitamin D** are needed.

## Fortification and Wellness

- In the early 1930s, **vitamin D** was first added to milk to aid in the absorption of **calcium** and phosphorus, preventing rickets.<sup>13</sup>
- In 1938, voluntary enrichment of flours and breads was initiated to prevent the development of deficiency diseases in the general population. Enrichments included thiamin, niacin, riboflavin and iron.<sup>13</sup>
- **Vitamin A** is required to be added to low and nonfat milk and certain other dairy products.<sup>13</sup>
- Even though vitamin C is naturally occurring in 100% orange juice, it is also fortified with vitamin C to make up for significant losses during concentration and processing.

**Fortification is a proven means of improving nutrient density and helping to prevent disease.**

## Traditional Beverages Don't Make the Grade

- 100% fruit juices from concentrate are not consistent nutritionally. They range in nutritional value from zero nutrients in some 100% apple juice from concentrate to varying percentages of several nutrients in 100% orange juice from concentrate. All 100% juices are high in calories, ranging from 110 to 160 calories per 8oz serving. A high percentage of fruit juice guarantees only one thing: high sugar and calories. The American Academy of Pediatrics, in their Policy Statement "The Use and Misuse of Fruit Juice in Pediatrics", states that "children 7 to 18 years should be limited to 8 to 12 ounces of juice per day".<sup>14</sup>
- Most sports drinks have very little nutritional value and have added sodium.
- Skim milk is an excellent beverage but many children can't or won't drink milk.

How do schools choose the most beneficial beverages for children?

## A Better Approach to Choosing Beverages for Schools

**“If Americans choose foods based on nutrient-density, they will essentially be choosing foods based on quality”<sup>15</sup>**

*Dr. Eileen T. Kennedy, Dean of the Friedman School of Nutrition Science and Policy of Tufts University and former secretary of the USDA*

- Many beverage manufacturers want you to categorize your beverages without regard to nutrient-density and contrary to recommendations in the Dietary Guidelines for Americans, so they can sell their retail-oriented beverages in schools.
- Rather than limiting choices to 100% juice, milk or water, etc., consider taking a nutrient-density approach. Restrictions such as “no carbonation”, “no added sugar” and requiring a minimum percentage of juice are counter-productive when nutrient-density is your ultimate goal.

## What are Nutrient-Dense Beverages?

- According to the Dietary Guidelines, nutrient-dense beverages are those beverages that contain significant amounts of vitamins and minerals and relatively few calories.<sup>16</sup>
- Nutrient-dense beverages address both calorie and nutrient concerns. Nutrient-dense beverages can also significantly improve the nutritional value of the a la carte line by providing significant amounts of “nutrients of concern”.

## Taste, Moderation & Nutrition

- Taste: If it doesn't taste good, children will not consume it. Beverages must be palatable.
- Moderation: Relatively few calories – a reasonable amount of calories for palatability (less than or equal to skim milk).
- Nutrition: Significant amounts of vitamins and minerals (nutrients of concern) – enough to offset the calories (nutrient-density).

## Nutrient-Dense Beverages and the a la Carte Line

- The USDA lunch attempts to provide the recommended amount of nutrients for children and adolescents, but statistics show that several “nutrients of concern” are not being met.
- The a la carte line has traditionally been viewed as a profit center for schools, but it can also be a means to bridge nutrient gaps identified by the Dietary Guidelines.
- If a child purchases a nutrient-dense beverage from the a la carte line, it can help to provide some of the nutrients that many children are missing in their diets as opposed to nutrient-poor beverages which provide “empty calories”.
- With nutrient-dense beverages, your a la carte line becomes an integral part of your child nutrition program while improving participation and retaining much needed a la carte profit.

## A Benchmark for Calories in Nutrient-Dense Beverages

- According to the Dietary Guidelines, small amounts of sugar added to nutrient-dense foods and beverages may increase a person's intake by enhancing the palatability of these products, thus improving nutrient intake without contributing excessive calories.<sup>17</sup>
- Currently, skim milk has between 80 and 90 calories per 8oz serving and 100% juice has 110 to 160 calories per 8oz serving. Using skim milk as a benchmark for a reasonable amount of calories, nutrient-dense beverages could have 90 calories or less per 8oz serving as long as they have the nutritional value to offset the calories (nutrient-density).

## Key Nutrients

- "Nutrients of Concern": **calcium, potassium, fiber, magnesium** and **vitamin E**
- Other key nutrients required in milk: **vitamins A and D**
- The FDA permits the health claim that a product is a good source of a nutrient if it contains 10% or greater of the Daily Value (DV) of the nutrient.
- **Fiber** is uncommon in beverages, most likely due to the cost. One gram of **fiber** (as much as half an orange) in a beverage is significant and should be encouraged, due to the positive impact of this nutrient.

## Recommended Criteria for Nutrient-Dense Beverages

### Calorie Criteria

- Maximum of 90 calories per 8oz serving

### Nutrient Criteria

Must meet at least three of the following:

- Minimum of 250 mg of **calcium** (25% DV) per 8oz serving
- Minimum of 350 mg of **potassium** (10% DV) per 8oz serving
- Minimum of 1g of **fiber** per 8oz serving
- Minimum of 2.25 IU of **vitamin E** (10% DV) per 8oz serving
- Minimum of 40 mg of **magnesium** (10% DV) per 8oz serving
- Minimum of 20 IU of **vitamin D** (10% DV) per 8oz serving
- Minimum of 500 IU of **vitamin A** (10% DV) per 8oz serving

Nutrient-dense beverages should be the next most prominent option on the a la carte line behind skim or low-fat milk. Use the above criteria to evaluate which beverages qualify for your a la carte line and maximize the positive impact your a la carte line can have on the diets of children in your schools!

## References

- <sup>1</sup> Dietary Guidelines for Americans 2005, Message from the Secretaries; i
- <sup>2</sup> Dietary Guidelines for Americans 2005, Chapter 2; 5
- <sup>3</sup> USDHHS: Healthy People 2010, U.S. Government Printing Office, Nov. 2000
- <sup>4</sup> Pediatrics Vol. 113 No. 1 January 2004
- <sup>5</sup> [http://en.wikipedia.org/wiki/Incidence\\_%28epidemiology%29](http://en.wikipedia.org/wiki/Incidence_%28epidemiology%29)
- <sup>6</sup> 7CFR Part 210.10(g)(2)
- <sup>7</sup> Dietary Guidelines for Americans 2005, Chapter 8; 40-41
- <sup>8</sup> Pediatric Clinics of North America 2001; 48: 969-980
- <sup>9</sup> Journal of the American Medical Assn, 1999; 282: 1539-1546
- <sup>10</sup> The Vitamin Sourcebook, Tonia Reinhard, 1998, Chapter 7; 129
- <sup>11</sup> Journal of the American Medical Assn, 12/20/06, Vol 296, No. 23
- <sup>12</sup> Am J Clin Nutr 2004; 79:362-71
- <sup>13</sup> <http://www.cfsan.fda.gov/~dms/wh-folic.html>
- <sup>14</sup> Pediatrics Vol. 107 No.5 May 2001, pp. 1210-1213 (reaffirmed 2/1/07)
- <sup>15</sup> Today's Dietitian, July 2006
- <sup>16</sup> Dietary Guidelines for Americans 2005, Chapter 2; 7
- <sup>17</sup> Dietary Guidelines for Americans 2005, Chapter 7; 36-37