Nutrition & Costs Comparisons of Select Canned, Frozen and Fresh Fruits and Vegetables

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FORWARD

Why Now? A Study on the Economics and Nutrition of Canned Fruits and Vegetables

Over the last decade the United States has struggled with a paradox that has served as the foundation of a $46 billion weight-loss industry, yet allowed 48 million Americans to wonder whether they would go to bed hungry. As a nation, we are overweight – many of us obese – yet undernourished. Sixty-eight percent of Americans are overweight or obese, however, 15 percent of Americans received 2011 aid from a Supplemental Nutrition Assistance Program, and 23.5 million people live in areas known as "food deserts" with little or no accessibility to nutritious foods. It's not hard to believe that virtually no Americans meet the public health goal for fruit and vegetable consumption as recommended by the health and nutrition experts.

Added to this bleak nutrition environment, a turbulent economy has driven up food prices at the same time that more and more people find themselves out of work or underemployed. Food assistance programs including Women Infants and Children (WIC) and the National School Lunch and Breakfast programs have reported sharp rises in participation.

Helping Americans incorporate more healthful foods into their diets is one piece toward solving the puzzle. Health and nutrition advocates, public policy leaders and even the food industry have made commitments to combat the burgeoning obesity crisis, which is posing one of the greatest threats to public health. From the USDA's MyPlate to the food industry's Healthy Weight Commitment Foundation, the prescription is the same: reduce calories and increase consumption of nutritious foods like fruits and vegetables. To make things more challenging, there is increasing pressure for consumers to select fresh fruits and vegetables. One needs to look no further than the White House vegetable garden and the growing number of farmer's markets in communities across the country to see the pervasive push for fresh fruits and vegetables as the healthy option.

But is that true? And how do canned foods – especially fruits and vegetables – fit into the equation for solving the obesity/hunger dilemma? That's what researchers at Michigan State University set out to discover through a comprehensive review of scientific literature comparing canned fruits and vegetables to fresh and frozen based on nutrition and cost. Through an analysis and review of more than 40 source materials, including scientific journal studies and nutrition data, the researchers found that despite long-held misconceptions about canned fruits and vegetables, they can be an excellent way for Americans to affordably meet their dietary needs.

The results of the Michigan State University Study clearly outline how canned fruits and vegetables uniquely address obesity and hunger by combining affordability, nutrition and convenience. With canned foods, Americans can stretch their food budget, get virtually the same nutrition as fresh and frozen fruits and vegetables and alleviate accessibility, storage and food safety issues.

While the outlook remains uncertain both on the economic, health and nutrition fronts, the Michigan State University study reveals an indisputable fact: canned fruits and vegetables play important roles in a healthier future for all Americans.

Introduction

Fruits and vegetables are important sources of key nutrients that many Americans under consume. According to the 2010 Dietary Guidelines for Americans, on average, Americans of all ages consume too few vegetables, fruits, high-fiber whole grains, low-fat milk and milk products, and seafood and they eat too much added sugars, solid fats, refined grains, and sodium. Increasing fruit and vegetable intake is a key recommendation of the 2010 Dietary Guidelines for Americans. These guidelines highlight the three main reasons to promote fruits and vegetables: fruits and vegetables are major contributors of key nutrients; consumption of vegetables and fruits is associated with reduced risk of many chronic diseases, including cardiovascular disease, certain types of cancer and type 2 diabetes; and most vegetables and fruits, when prepared without added fats or sugars, are relatively high in dietary fiber and low in calories. While an overwhelming majority of all Americans are at risk for diet-related ailments, those at greatest risk are the poor, who have documented barriers to healthy food alternatives (Mazur, Marquis and Jensen 2003). This group tends to have lower mobility with restricted access to grocery stores relative to fast food restaurants and convenience stores. With limited access to grocery stores, this group must purchase fruits and vegetables for delayed consumption to last until the next visit. By having limited access to grocery stores, purchases of packaged fruits and vegetables for delayed consumption is a viable option for low-income households wishing to meet USDA dietary guidelines in consumption of fruits and vegetables.

Packaged fruits and vegetables, namely, canned and frozen varieties of fruits and vegetables provide a convenient way to promote intake. Canned and frozen fruits and vegetables have a shelf life longer than their fresh counterpart and are ready to eat and easy to use in meal preparation. These features make canned and frozen fruits and vegetables valuable alternatives for busy and cost-conscious consumers. Due to economies of scale and scope, big-box grocery stores, wholesale clubs and supercenters are increasing the geographic isolation of many shoppers and decreasing the number of trips to buy food goods (Martinez, 2007). Food consumption is increasingly directed at pre-packaged and low-priced bulk food items. Consumers also expect food packaging to be recyclable and environmentally sensitive (Rokka and Uusitalo, 2008).

There has been a great deal of research on the impact of canning on the nutritional value of fruits and vegetables, however, determining the impact is not an exact science. Factors that impede precise measurements and valuations of the effect of canning fruits and vegetables on nutrient value include: the type of fruit and vegetables, differences in research methodologies and practices and real world food storage and preparation. For example, fresh produce loses its nutrient value faster than canned produce. And as described below, cooking and other factors also alters nutrient content.

Despite the challenges in measuring the nutrient content of fruits and vegetables across packaging options, there has been sufficient research to build real knowledge about nutritional merits across multiple packaging options. Equally important is to make sense of the economics behind different packaging options. The literature seldom addresses the cost effectiveness of raw versus processed fruits and vegetables into canned and frozen packaging. More so, few have explored the nutritional content of food packaging relative to consumer costs. This question is relevant to households and to policy in

the face of declining American health that is directly linked to diet and lifestyle. Equally, this question is relevant to social safety net policies designed to cost effectively secure low-income food supply.

This paper discusses research on nutritional uptake across fresh and processed fruit and vegetable options and describes well-established measures of nutrient intake across multiple fruit and vegetable items with a comparison of the nutrient uptake by packaging – including raw, canned, and frozen. It concludes with a summary of findings.

Part 1: Review of the Nutrition Comparison Literature

The most recent comprehensive review of the nutritional attributes of canned vegetables was carried out by Rickman, Bruhn and Barrett on behalf of the Canned Food Alliance in a two-part study. Part 1 of the study analyzed vitamins C and B as well as phenolic compounds. Part 2 analyzed vitamin A and carotenoids, vitamin E, minerals and fiber. Findings suggest that freezing and canning actually preserve nutrient value (Rickman, Barrett and Bruhn, 2007; Rickman, Bruhn and Barrett, 2007). That is, while heat treatment of processed products can cause initial loss of vitamin C and B, the remaining nutrients and nutrient levels remain more stable when stored relative to fresh produce. While frozen products initially lose fewer nutrients than canned products they lose more nutrients over time due to oxidation, even in a frozen state.

Unlike canned vegetables, where vitamin C content remains relatively constant after canning, the amount of vitamin C in fresh vegetables begins to decline immediately after harvest, and continues to decline during storage. In addition, the amount of vitamin C lost during heating is higher for fresh produce compared to canned (Rickman, Barrett and Bruhn, 2007a). Lee *et al.* also determined that canned foods had lower levels of vitamin C due to blanching, but the amount of vitamin C loss depends on crop varieties and grower processes that directly influence vitamin C content (Lee *et al.*, 1976) – a consistent finding in other research (Breene, 1994). Commodities considered in the Lee *et al.* study included peas, corn, beets, wax beans, and green beans. Green beans lost a great deal of their vitamin C content during blanching, and finished canned beets contained 23 percent of their original vitamin C content. However, the authors note that differences in processing techniques lead to different results (Lee *et al.*, 1976).

Canned fruits and vegetables tend to have slightly lower levels of vitamin B than fresh cooked, with the exception of tomatoes. Canned tomatoes tend to have higher levels of B vitamins, with the exception of folate. However, the levels of B vitamins also depend on how produce is prepared.

Depending on the packing technique canning may or may not reduce phenolic compounds. Eating a diet rich in phenolic compounds may reduce the risk of cancer and heart disease, but beneficial impacts on overall health have yet to be documented (Rickman, Barrett and Bruhn, 2007). Fruits and vegetables that are packed in brine or syrup tend to lose phenolic compounds and those that are vacuum packed or canned without liquids tend to retain their levels of phenolic compounds (Rickman, Barrett and Bruhn, 2007).

For vitamin A and carotenoids, vitamin E, minerals and fiber, the results indicate that these nutrients were generally similar in fresh and processed form. In some cases carotenoid levels were higher in canned than in fresh or frozen form. Industrial cultivars of tomatoes appear to have higher levels of vitamin E and carotenoids compared to fresh varieties (Rickman, Bruhn, and Barrett, 2007). The variability of alpha and beta carotene, beta cryptoxanthin, and total provitamin A are shown in Table 1. In essence, Table 1 shows that Vitamin A content mostly increases in canned packaging for all vegetables. However, reported Vitamin A content declined for peaches and tomatoes.

Table 1: Percent Change (Dry Weight) in Total Beta Carotene and Provitamin A Due to Canning

Commodity	Beta Carotene	Alpha Carotene	Beta Cryptoxanthin	Total Provitamin A
Carrots	7 percent increase	33 percent increase	ND	16 percent increase
Collard Greens	50 percent increase	ND	ND	50 percent increase
Peaches	50 percent decrease	ND	40 percent decrease	49 percent decrease
Spinach	19 percent increase	ND	ND	19 percent increase
Sweet Potato	22 percent increase	ND	ND	22 percent increase
Tomato	13 percent decrease	ND	ND	13 percent decrease

ND=No Difference

Source: Rickman, Barrett and Bruhn

Mineral values tend to be dependent on commercial processing techniques and the mineral content of water used by the processing facility. In fact, mineral content in canned items may reflect increases due simply to the uptake from hard water or the addition of brines (Rickman Bruhn and Barrett, 2007). Researchers further note that cooked fresh vegetables contained similar amounts of beta carotene as cooked canned and frozen vegetables and that processing does not effectively reduce the fiber content of edible portions (Rickman, Bruhn and Barrett, 2007).

In 1997, the University of Illinois (Illinois Study) Department of Food Science and Human Nutrition conducted a study on the conservation of nutrients in canned, frozen and fresh fruits and vegetables. The study, funded by the Steel Packaging Council, analyzed 14 fruit items (applesauce, apricots, blackberries, blueberries, grapefruit, Mandarin oranges, peaches, pears, pineapple, purple plums, strawberries, sweet Bing cherries, stewed and whole tomatoes, and olives) and 11 vegetables (asparagus, beets, carrots, corn, green beans, mushrooms, peas, pumpkins, spinach, sweet potatoes, and white potatoes). The fundamental findings of the study are as follows:

- **Canning Increases Fiber Availability:** The canning process does not impact the fiber content, and the heating process appears to make the fiber more soluble and therefore more useful, to the human body.
- **Vitamin A is On Par or Higher than Fresh:** Little vitamin A is lost in the canning process, and in the case of canned pumpkin the level is higher than in the raw form.
- **Folate is On Par with Fresh:** Folate levels remain mostly constant during the canning process.
- **Vitamin C in Canned Foods Remains Stable:** While some vitamin C is lost during the canning process, most of what is lost ends up in the liquid and the level of vitamin C remains stable during the one- to two-year shelf life of the product (Illinois Study, 1997).

The study also notes that canned foods are the safest form of food because barriers to microbiological contamination generated during the canning process. The authors also report that using canned vegetables and beans in soups and stews provide the same nutritional value as fresh ingredients would provide (Illinois Study, 1997).

Breene also conducted a review of the literature in 1994. He determined that canning destroys heat labile nutrients and antinutrients such as lectins and antitrypsin, kills microorganisms and can improve digestibility. Properly processed packaged or stored fruits and vegetables can be as healthful, if not more healthful, than their fresh counterpart (Breene, 1994).

Rickman, Barret and Bruhn, conclude that, "losses of nutrients during fresh storage may be more substantial than consumers realize. Depending on the commodity, freezing and canning processes may preserve nutrient value, and while canned foods are often regarded as less nutritious than fresh or frozen products, research reveals that this is not always true."

Other studies tend to support the findings. Although processing food tends to reduce nutrient content, the nutrient loss is not absolute. In some research, canned fruits and vegetables exhibited higher nutrient contents than fresh. Lessin, Catigani and Schwartz considered the levels of provitamin A carotenoids in fresh and processed fruits and vegetables, finding that canning increased the amount of measured provitamin A carotenoids by 16 to 50 percent. The authors believe the increases were most likely a result of increased extraction efficiency, inactivation of enzymes capable of degrading carotenoids, and/or loss of soluble solids into the liquid canning medium (Lessin, Catigani and Schwartz, 1997). Hunter and Fletcher, studying peas and spinach, analyzed antioxidant activity of fresh, frozen, jarred and canned vegetables and concluded that, "frozen vegetables have similar antioxidant activities to the equivalent vegetables purchased fresh from supermarkets and much higher levels compared to canned and jarred vegetables." They also find that antioxidant activity of fresh vegetables declines over time, while the literature suggests that it tends to remain stable in canned products (Hunter and Fletcher, 2002). Dewanto *et al.* (2002) found that antioxidant activity increases the longer the thermal processing time fruits and vegetables are subjected to when canning. Kramer analyzed the impact of cold storage on nutritional values in a wide variety of foods. The findings suggested that little vitamin C is lost in canned fruit and vegetable juices if the juice is stored at temperatures of 5 degrees Celsius or less. More is lost if the storage temperature is higher. Storage temperature has a lesser impact on vitamin A losses relative to vitamin C (Kramer, 1977). The results are similar for canned fruits and vegetables, although both differ in losses in vitamin C, B1, and B2 in storage and losses are time and temperature dependent (Kramer, 1977).

Similar findings have been suggested for antioxidant activity, fiber and protein across packaging options. Jiratanan and Liu studied the antioxidant activity of processed table beets and green beans. They found that antioxidant activity of processed beets remained constant despite an eight percent loss of vitamin C, and a 30 percent loss of dietary folate. The phenolic content of processed beets increased by five percent. In the case of processed green beans, antioxidant activity declined by 20 percent, due primarily to a 32 percent reduction in phenolic compounds. The level of vitamin C and dietary folate remained constant (Jiratanan and Liu, 2004). They concluded that, "depending on the particular produce, and

processing parameters and methods, thermal processing may enhance, reduce or cause no change in total antioxidant activity from that of fresh produce," (Jiratanan and Liu, 2004). Makhlouf *et al.* (1995) looked at the nutrient and fiber content of raw, canned and frozen beans, sweet corn and peas grown and processed in Quebec. The difference in fiber content between raw and processed vegetables into canned and frozen packaging was negligible. The authors warn that, "in practice it is possible that processed vegetables are comparable to boiled products (Makhlouf *et al*, 1995). Finally, Wang, Chang and Grafton (1988) analyzed the protein value of canned pinto and navy beans and determined that while canning reduced the amount of protein in beans, the impact was dependent on the variety of bean analyzed. Their study shows that there is relatively little difference in protein values between raw and canned beans, and that cooking raw beans to make them digestible might reduce protein values.

One of the most comprehensive recent works on the nutrition content of canned food was carried out by Murcia, Jimenez and Martinez-Tome (2009), finding limited declines in antioxidant activity for canned relative to fresh in the following vegetables: artichoke, asparagus, Broad been, beetroot, broccoli, Brussels sprout, carrot, cauliflower, celery, chicory, cucumber, eggplant, endive, garlic, Green bean, leek, lettuce, corn, onion, pea, peer, radish spinach, Swiss chard, and zucchini. Researchers found that the canning process led to a decline in antioxidants in garlic, corn, peas, and leek. Losses were in the range of between 18 and 35 percent.

Summary of Nutrition Comparison Findings

The body of evidence suggests that, overall, canned vegetables and fruits are on par with fresh and frozen. While in some cases the canning process slightly compromises the nutritive value, a similar affect is observed with prolonged storage life for fresh – and even frozen produce. Therefore, the net is that canned, fresh and frozen vegetables and fruits are comparable nutritionally.

While making precise statements about the nutrient content of fruit and vegetables across packaging options is difficult, it appears that canning may present marginal declines in some vitamins in some instances, though the effect is not universal. In fact some studies suggest that the canning process may enhance vitamin content. While the evidence tends to support that vitamin C and some forms of B vitamins tends to be lower in canned packaging for many fruits and vegetables, canning appears to have little effect on vitamins A and E. For the latter there are multiple studies that show that the canning process enhances vitamin A and E values. Additionally, minerals, protein and fiber are not significantly impacted by the canning process; in fact, some authors suggest that canning increases the digestible fiber content of many vegetables. In the case of minerals, some minerals appear to be lost in the canning process while others appear to increase.

The mandate from health advocates and public policy officials to increase fruit and vegetable consumption and therefore improve public health coupled with the nutritional comparability of canned fruits and vegetables to fresh and frozen, clearly defines the role of canned foods in the lives of Americans. The evidence suggests that canned fruits and vegetables can play an important role in a healthy diet.

Part 2: Comparisons of Nutritional Content and Prices of Fruits and Vegetables across Packaging Options

The following section compares the nutritional content and prices of fruits and vegetables across packaging options to provide a more complete picture of the relative consumer returns across multiple packaged goods. Packaging options include whole-fresh produce, frozen-processed fruits and vegetables, and canned-processed fruits and vegetables. This report synthesizes existing statistics of nutrient uptake by competing packaging options and consumer costs based on edible portions of common fruits and vegetables. Dietary values of intake are based on nationally recognized nutrient recommendations established by the Institute of Medicine. This analysis follows similar analyses that compare nutrient content across food groups relative to costs (Connell et al.) and affordability of healthy food choices (Darmon et al. 2005).

Price Estimates

The USDA Economic Research Service (ERS) provides periodic consumer price references for fruits and vegetables across multiple packaging options. The last such estimate was published in February 2011 using 2008 Nielsen Homescan price data (Stewart et al. 2011). The Nielsen Homescan data provides purchase data from a panel of 61,440 households with sample weights for extrapolating across the entire U.S. population of households. The Homescan panel uses scanners to record purchase quantity, price, weight, date, and type of retail facility purchased from. The scanners use the Universal Product Code (UPC label) in identifying the purchased items. A recent study found that the accuracy of the Nielsen Homescan data is consistent with most survey data used in research (Einav, Leibtag, and Nevo 2008).

ERS researchers adjust the Homescan price data to reflect the prices per edible portions. In many cases, the purchase price of fresh fruits and vegetables include non-edible food parts. The edible portion excludes food parts such as fruit cores, pits and stems that are not part of the food-consumable component of purchase. For whole-fresh fruits and vegetables, consumers purchase raw produce and remove inedible parts in preparation. For processed foods, processors mostly remove edible parts before packaging. Hence when pricing purchases on weight, comparing prices for fresh produce in its raw form to processed produce sold in frozen packages or in cans may not accurately reflect the relative costs of consumption. In their price comparison, the ERS reduced purchase weight of fresh produce by USDA factors published in their report *Food Yields Summarized by Different Stages of Preparation* (Matthews and Garrison 1975),[1] making all prices equally comparable.

Nutrient Uptake Estimates

The USDA's Food and Nutrient Database for Standard Reference, 24 (SR24) (U.S. Department of Agriculture 2011; USDA 2011)[2] is used to compare dietary intakes of fruits and vegetables across alternative packaging. The SR24 is a searchable online database of food composition of over 7,500 food

[1] Details on how price of consumer quantities can be found at http://www.ers.usda.gov/data/FruitVegetableCosts/index.htm/, referenced 11/28/2011.

[2] Downloaded from http://www.nal.usda.gov/fnic/foodcomp/search/, referenced 11/14/2011

items. It contains nutrient data of up to 143 components including vitamins, minerals, amino and fatty acids and others that make up the dietary intake from foods. Because nutrient content of fresh fruits and vegetables degrades over time, produce is stored more than two days before shipment for analysis (Trainer et al. 2010). Nutrient components are reported on a per-portion basis, where portions are measured in cups, gram weight, serving size, etc. For the purposes of this analysis, portions are measured as cups or as 100 gram weight depending on the coarseness of the food item. That is, coarse fruits and vegetables such as sliced carrots may not be consistently measured using a cup measure but rather are measured in milligrams.

The Food and Nutrition Board of the U.S. National Academies of Science establishes Dietary Reference Intakes (DRIs) for a variety of age groups. We use the average Recommended Dietary Allowances (RDAs) for adult intake of 29 vitamins and elements in scoring nutrient values. The RDAs represent the average daily dietary intake of nutrients sufficient to meet requirements of 97 percent of healthy persons (Penland 2011). Nutrient scores are comparable across all packaging options and reflect the contribution of each packaging option in reaching the RDA.

As RDAs vary by nutrient, the dietary value of nutrient intake cannot be summarized by a simple summation of vitamin intakes. That is, a milligram of vitamin D cannot be added to a milligram of vitamin E to create a meaningful measure of vitamin intake. Additionally, there is no generally agreed-upon proper measurement of nutrient density of whole foods (Drewnowski 2005; Jiratanan and Liu 2004). Therefore, an ad-hoc, normalized measure, or score, of nutrient uptake is used where nutrient content is measured against average adult RDA. The score is calculated as follows. First nutrient intake reported by the SR24 is divided by the RDA. Then the ratios are summed over all 29 vitamins and elements. This is then divided by the calorie intake, such that scores are relative to the caloric intake.[3] That is, the score controls for differences in caloric intake across packaging options. Higher scores are preferable. The resulting standardized values, because they combine non-equal nutrient intakes, provide an index comparable across alternative intakes of the same commodity.

Fresh, frozen and canned packaged nutrient indices of eight vegetables and ten fruit items, representing food items commonly purchased in all three packaging options were compared. Most vegetable families are represented, including dark green leafy, red and orange, legumes, starchy and other vegetables. Many fruit groups are also represented including berries, cherries, and nectarines. Tomatoes, though often consumed as a vegetable, are technically a fruit and are included in the fruit section of this study.

Findings

Table 2 shows the combined nutrient scores and prices per edible portions of the eight vegetables reviewed. Components of the nutrient scores for each vegetable can be found in the Appendix. The findings show that vitamin intake indices of the eight common vegetables are remarkably similar across

[3] The index is calculated with the following equation, where *i* is the food package – fresh, frozen or canned, *SR24* is the packaging content and *DRI* is the dietary needs of vitamin *n* in packaging *i*, and *Cal* is the calories per unit. The calculation is as follows, .

the three packaging options. There are some exceptions; for two leafy green vegetable items, spinach and turnip greens, fresh provides a more nutritious option relative to frozen and canned. For green beans and carrots, canned packaging offers a preferred nutritional option. For the remaining four vegetables, either option provides comparable vitamin intakes.

Table 2: Nutrient Scores and Prices for Vegetables

Indices of Vitamin Intake Per Calorie Consumed[¥] | **Price per Edible Cup**[§]

	Canned	Frozen	Fresh	Canned	Frozen	Fresh
White Corn	0.013	0.011	0.014	$ 0.69	$ 1.40	$ 1.17
Yellow Corn	0.013	0.012	0.014	$ 0.69	$ 1.40	$ 1.17
Carrots, Whole	0.061	0.048	0.049	$ 0.69	$ 1.19	$ 0.77
Spinach	0.298	0.221	0.334	$ 0.84	$ 1.51	$ 3.92
Turnip Greens	0.096	0.079	0.177	$ 0.81	$ 1.48	$ 2.11
Green Beans	0.049	0.035	0.039	$ 0.67	$ 1.22	$ 3.23
Peas	0.023	0.027	0.030	$ 0.74	$ 1.34	*$ 1.83*
Asparagus	0.083	0.075	0.084	$ 2.09	$ 3.61	$ 1.83

¥ Sources: Author's calculation using USDA's Food and Nutrient Database for Standard Reference, Release 24, and National Academies Institute of Medicine, Food and Nutrition Board, Recommended Dietary Allowances and Adequate Intakes for Vitamins and Elements

§ Sources: Stewart, Hayden, Jeffrey Hyman, Jean C. Buzby, Elizabeth Frazão, and Andrea Carlso. 2011. *How Much Do Fruits and Vegetables Cost?* In Economic Information Bulletin. Washington, DC: USDA: Economic Research Service. Italicized values are from Reed, J., E. Frazao, and R. Itskowitz. 2004. *How Much Do Americans Pay for Fruits and Vegetables?* Vol. 790, Economic Information Bulletin. Washington, DC: US Dept. of Agriculture, Economic Research Service.

While nutrient content across packaging options suggests that no packaging option has a clear nutrient advantage, systematic differences are found when comparing prices. For seven of the eight vegetables in this study, the consumer prices per edible cup of canned vegetables are lower than the prices of frozen or fresh-packaged options. More so, consumer costs for canned vegetables can be as low as 50 percent of the costs of frozen alternatives and as low as 20 percent of the cost of fresh alternatives based on the cost per edible portion. Frozen packaging affords cost savings over fresh vegetables for four of the eight vegetables represented here, but command higher prices than canned vegetables for all eight.

While both canned and frozen packaging provides for deferred consumption, canned vegetables afford lower consumer costs and higher nutritional content. With few exceptions, nutritional content is comparable across all packaging options. Canned vegetables afford households greater access through lower costs. For example, household food budgets can be stretched by nearly 50 percent with canned sweet corn over fresh and nearly five hundred percent times with canned green beans. Similar savings are found by comparing canned vegetables to frozen. In many cases, the savings are accompanied with increased nutrient content of canned packaging.

Nutrient content and prices of common fruits across packaging options are compared next. As many fruit varieties do not have frozen packaging options or those options are uncommon, the report omits frozen nutrient scores and prices where reliable measures are not available. Table 3 shows the combined nutrient scores and prices per edible portions of the ten fruit items reviewed. For many fruit items the nutrient intakes are comparable across packaging options. Alternatively, the nutrient content of fresh strawberries and raspberries significantly exceeds that of the canned counterpart. In fact, for all

fruits compared besides peaches, fresh provides the greatest nutrient intake per calorie. Frozen packaging also tends to provide greater nutrient content relative to canned.

Table 3: Nutrient Scores and Prices for Fruit

	Index of Vitamin Intake Per Calorie Consumed[¥]			Price per Edible Cup Equivalence[§]		
	Canned	**Frozen**	**Fresh**	**Canned**	**Frozen**	**Fresh**
Tomatoes	0.037	na	0.043	$ 0.41	na	$ 1.28
Peaches	0.014	0.016	0.013	$ 0.58	na	$ 0.66
Strawberries	0.009	0.030	0.041	$ 0.66	$ 1.14	$ 0.89
Blue Berries	0.005	0.011	0.014	$ 1.60	$ 1.35	$ 1.31
Cherries	0.247	0.520	0.703	$ 1.50	na	$ 1.22
Raspberries	0.007	0.010	0.025	$ *0.69*	$ *0.54*	$ *0.64*
Blackberries	0.010	0.023	0.031	$ 1.51	$ 1.13	$ 1.71
Pineapples	0.017	na	0.031	$ 0.49	na	$ 0.70
Apricots	0.005	na	0.016	$ *0.37*	na	$ *0.25*
Pears	0.016	na	0.035	$ 0.58	na	$ 0.42

¥ Sources: Author's calculation using USDA's Food and Nutrient Database for Standard Reference, Release 24, and National Academies Institute of Medicine, Food and Nutrition Board, Recommended Dietary Allowances and Adequate Intakes for Vitamins and Elements

§ Sources: Stewart, Hayden, Jeffrey Hyman, Jean C. Buzby, Elizabeth Frazão, and Andrea Carlso. 2011. *How Much Do Fruits and Vegetables Cost?* In Economic Information Bulletin. Washington, DC: USDA: Economic Research Service. Italicized values are from Reed, J., E. Frazao, and R. Itskowitz. 2004. *How Much Do Americans Pay for Fruits and Vegetables?* Vol. 790, Economic Information Bulletin. Washington, DC: US Dept. of Agriculture, Economic Research Service.

Compared to vegetables, nutrient intakes for fruits tend to exhibit larger variation across packaging options. Much of this variation may reflect variation in caloric density across packaging options. Because scores are based on nutrient content per calorie, packaging options that are higher in calories may dampen the nutrient scores. For example, many canned fruits are packaged with syrup, adding sugars and calories for a given serving. This is illustrated in the Appendix for the case of strawberries. A 100 gram portion of canned strawberries delivers 92 calories (kcal) relative to 25 for frozen and 32 for fresh. In the absence of the calories from syrup, the nutrient scores of canned strawberries would be on par with fresh and frozen varieties. Hence the nutrient per-calorie score of canned strawberries is much lower than for fresh and raw strawberries not packaged with added sugars. Unfortunately, this is the nature of several canned fruit options that include many products of peaches, strawberries, black and blue berries, cherries, raspberries and apricots. In this analysis, canned fruit nutrient scores of only peaches, pineapples, pears and tomatoes are reported without added sugars. For the remainder, the National Nutrient Database for Standard Reference does not report nutritional values for canned packaging without syrup.

Price comparisons in Table 3 show that prices are fairly comparable across the three packaging options. However, only four of the 10 common fruits have comparable frozen price statistics. Canned tomatoes, aside from providing greater nutrient intake, are also substantially less expensive than fresh. Additionally, the price of canned blackberries and pineapples are significantly less expensive, while peaches and strawberries are marginally less expensive to acquire. Many of the remaining canned fruit items are comparably priced relative to fresh. However, canned blue berries and cherries tend to be

substantially more expensive. In sum, price comparisons of packaging options indicate no clear delineation in packaging costs of fruits.

While fresh fruits provide greater nutrient intake than canned and frozen, households may find it challenging to acquire fresh fruit year-round. Frozen and canned packaging options help to remedy the seasonal availability of fruits, though frozen fruits may be limited to certain fruit items amenable to freezing. This limits off-seasonal availability for many fruit items. The Nielsen Homescan data used in the USDA price report provided limited frozen options relative to canned for deferred consumption of fruits. That is, households have greater utilization of canned fruits relative to frozen for year-round consumption and have seasonal access to fresh and in some cases is the only option for off-season consumption of fruits.

Summary of Comparisons of Nutritional Content and Prices

This report set out to estimate the consumer cost of nutrient intake for fruits and vegetables across fresh, frozen and canned packaging options. The issue of food costs and healthy food choices is relevant to current food policy discussions in the U.S., where affordability and availability of healthy food options have taken a central discourse on the causes of obesity and other diet-related diseases. The economic costs of obesity and poor diet choices are well established (Thorpe, Florence, Howard, and Joski, 2004; Wellman and Friedberg 2002). Many researchers see low affordability and availability of nutritious food options as a core issue of America's obesity epidemic (Drewnowski and Barratt-Fornell 2004; Drewnowski and Darmon 2005). While researchers emphasize the importance of access to fresh produce, much of the literature suggests that low-income households have limited access to quality grocery stores, and that shelf-life is an important feature of their food stocks. Canned and frozen packaging extends the effective life of fruits and vegetables and this study shows that in the case of vegetables, they are also price competitive with regard to nutrient uptake.

Comparing nutritional content of eight common vegetables, the literature shows no systematic reduction in nutrient uptake from processed foods into canned and frozen packaging. From a consumer perspective, canned vegetables are the most economical package options for nutrient uptake from the eight vegetables reviewed in this study. Canned vegetables provide households cost savings of up to 20 percent relative to fresh. Frozen packaging also tends to be price competitive, but in some cases affords lower shelf life. Freezer space may be a limiting factor for some households seeking to defer consumption of vegetables, leaving canned as a preferable option. This analysis shows that cost savings of canned and frozen vegetables are not at the expense of lost nutrient content.

Relative to vegetables, processed fruits show greater variation between processed and fresh options. Much of this variation can be attributed to methods and additives introduced in the production process. More specifically, the fruits available in the USDA database are those that have been packaged in syrup rather than water or natural fluids and many fresh fruit items are not amenable to processing. For consumers, processed fruits tend to be competitive with fresh fruits, and are available year-round. Of the 10 fruit items reviewed in this study, canned packaging provided the lowest cost for four items; frozen packaging provided the lowest cost for two; and fresh for the remaining four. However,

regardless of price many fruit items have extremely limited availability throughout much of the year, and many people, especially those living in low income communities have limited access throughout the year to fresh produce (Algert, Agrawal and Lewis, 2006).

Given the limited availability of fresh fruit, canning and freezing options can help consumers meet fruit and vegetable recommendations throughout the year. As availability is a necessity for meeting USDA dietary guidelines, processed fruits and vegetables in canned and frozen packaging plays an important role for American consumers, and is a cost effective means toward meeting food security needs of low income households.

As Breene notes, consumer costs of consumption may play a dominant role in determining uptake of nutrients through fruits and vegetables. Darmon *et al.* (2005) determined that on a calorie basis fresh fruits and vegetables are more expensive to alternative packaging options. Especially for those with limited access, financial resources and storage, canned and frozen packaged fruits and vegetables may be a better option. Canned and frozen packaging provides deferred consumption and as Rickman, Barrett and Bruhn observe, fresh, frozen and canned fruits and vegetables are nutritionally similar at the time of consumption.

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White Corn

	RDA		Corn, sweet, white, canned, whole kernel, regular pack, solids and liquids			Corn, sweet, white, frozen, kernels cut off cob, unprepared			Corn, sweet, white, raw		
			Unit 1 Cup Edible Portion			Unit 1 Cup Edible Portion			Unit 1 Cup Edible Portion		
	Units		**Proximates**			**Proximates**			**Proximates**		
	kcal		Calories	164		Calories	145		Calories	132	
		Std.	**Minerals**		**Score**	**Minerals**		**Score**	**Minerals**		**Score**
Calcium, Ca	mg	1000	Calcium, Ca	10.00	0.010	Calcium, Ca	7.00	0.007	Calcium, Ca	3.00	0.003
Iron, Fe	mg	13	Iron, Fe	1.05	0.081	Iron, Fe	0.69	0.053	Iron, Fe	0.80	0.062
Magnesium, Mg	mg	370	Magnesium, Mg	41.00	0.111	Magnesium, Mg	30.00	0.081	Magnesium, Mg	57.00	0.154
Phosphorus, P	mg	700	Phosphorus, P	131.00	0.187	Phosphorus, P	114.00	0.163	Phosphorus, P	137.00	0.196
Potassium, K	mg	4700	Potassium, K	420.00	0.089	Potassium, K	346.00	0.074	Potassium, K	416.00	0.089
Sodium, Na	mg	1500	Sodium, Na	545.00	0.363	Sodium, Na	5.00	0.003	Sodium, Na	23.00	0.015
Zinc, Zn	mg	9.5	Zinc, Zn	0.92	0.097	Zinc, Zn	0.61	0.064	Zinc, Zn	0.69	0.073
Copper, Cu	mg	900	Copper, Cu	0.14	0.000	Copper, Cu	0.06	0.000	Copper, Cu	0.08	0.000
Manganese, Mn	mg	2.05	Manganese, Mn	0.08	0.041	Manganese, Mn	0.21	0.101	Manganese, Mn	0.25	0.121
Fluoride, F	µg	3500	Fluoride, F	46.10	0.013	Fluoride, F	24.10	0.007	Fluoride, F	0.00	0.000
Selenium, Se	µg	55	Selenium, Se	1.50	0.027	Selenium, Se	1.20	0.022	Selenium, Se	0.90	0.016
Chromium	µg	30	Chromium	0.00	0.000	Chromium	0.00	0.000	Chromium	0.00	0.000
Iodine	µg	150	Iodine	0.00	0.000	Iodine	0.00	0.000	Iodine	0.00	0.000
Molybdenum	µg	45	Molybdenum	0.00	0.000	Molybdenum	0.00	0.000	Molybdenum	0.00	0.000
Chloride	g	2.3	Chloride	0.00	0.000	Chloride	0.00	0.000	Chloride	0.00	0.000
			Vitamins			**Vitamins**			**Vitamins**		
Vitamin C, total ascorbic acid	mg	82.5	Vitamin C, total ascorbic acid	14.10	0.171	Vitamin C, total ascorbic acid	10.60	0.128	Vitamin C, total ascorbic acid	10.50	0.127
Thiamin	mg	1.15	Thiamin	0.07	0.058	Thiamin	0.14	0.119	Thiamin	0.31	0.268
Riboflavin	mg	1.2	Riboflavin	0.16	0.130	Riboflavin	0.12	0.097	Riboflavin	0.09	0.077
Niacin	mg	15	Niacin	2.40	0.160	Niacin	2.85	0.190	Niacin	2.62	0.175
Pantothenic acid	mg	5	Pantothenic acid	1.34	0.267	Pantothenic acid	0.46	0.092	Pantothenic acid	1.17	0.234
Vitamin B-6	mg	1.3	Vitamin B-6	0.10	0.073	Vitamin B-6	0.29	0.226	Vitamin B-6	0.09	0.065
Folate, total	µg	400	Folate, total	97.00	0.243	Folate, total	59.00	0.148	Folate, total	71.00	0.178
Vitamin B-12	µg	2.4	Vitamin B-12	0.00	0.000	Vitamin B-12	0.00	0.000	Vitamin B-12	0.00	0.000
Vitamin A, RAE	mcg_RAE	800	Vitamin A, RAE	0.00	0.000	Vitamin A, RAE	0.00	0.000	Vitamin A, RAE	0.00	0.000
Vitamin E (alpha-tocopherol)	mg	15	Vitamin E (alpha-tocopherol)	0.00	0.000	Vitamin E (alpha-tocopherol)	0.00	0.000	Vitamin E (alpha-tocopherol)	0.11	0.007
Vitamin D (D2 + D3)	µg	15	Vitamin D (D2 + D3)	0.00	0.000	Vitamin D (D2 + D3)	0.00	0.000	Vitamin D (D2 + D3)	0.00	0.000
Vitamin K (phylloquinone)	µg	110	Vitamin K (phylloquinone)	0.00	0.000	Vitamin K (phylloquinone)	0.00	0.000	Vitamin K (phylloquinone)	0.50	0.005
Choline, total	mg	487.5	Choline, total	0.00	0.000	Choline, total	0.00	0.000	Choline, total	0.00	0.000
Biotin	µg	30	Biotin	0.00	0.000	Biotin	0.00	0.000	Biotin	0.00	0.000
Total Score					**0.013**			**0.011**			**0.014**

Yellow Corn

	RDA		Corn, sweet, yellow, canned, brine pack, regular pack, solids and liquids			Corn, sweet, yellow, frozen, kernels cut off cob, unprepared			Corn, sweet, yellow, raw		
			Unit 1 Cup Edible Portion			Unit 1 Cup Edible Portion			Unit 1 Cup Edible Portion		
	Units		**Proximates**			**Proximates**			**Proximates**		
	kcal		Calories	156		Calories	120		Calories	125	
		Std.	**Minerals**		**Score**	**Minerals**		**Score**	**Minerals**		**Score**
Calcium, Ca	mg	1000	Calcium, Ca	10.00	0.010	Calcium, Ca	5.00	0.005	Calcium, Ca	3.00	0.003
Iron, Fe	mg	13	Iron, Fe	0.92	0.071	Iron, Fe	0.57	0.044	Iron, Fe	0.75	0.058
Magnesium, Mg	mg	370	Magnesium, Mg	38.00	0.103	Magnesium, Mg	24.00	0.065	Magnesium, Mg	54.00	0.146
Phosphorus, P	mg	700	Phosphorus, P	118.00	0.169	Phosphorus, P	95.00	0.136	Phosphorus, P	129.00	0.184
Potassium, K	mg	4700	Potassium, K	348.00	0.074	Potassium, K	290.00	0.062	Potassium, K	392.00	0.083
Sodium, Na	mg	1500	Sodium, Na	499.00	0.333	Sodium, Na	4.00	0.003	Sodium, Na	22.00	0.015
Zinc, Zn	mg	9.5	Zinc, Zn	1.00	0.105	Zinc, Zn	0.52	0.055	Zinc, Zn	0.67	0.071
Copper, Cu	mg	900	Copper, Cu	0.07	0.000	Copper, Cu	0.05	0.000	Copper, Cu	0.08	0.000
Manganese, Mn	mg	2.05	Manganese, Mn	0.21	0.102	Manganese, Mn	0.17	0.081	Manganese, Mn	0.24	0.115
Fluoride, F	µg	3500	Fluoride, F	46.10	0.013	Fluoride, F	19.90	0.006	Fluoride, F	0.00	0.000
Selenium, Se	µg	55	Selenium, Se	1.30	0.024	Selenium, Se	1.00	0.018	Selenium, Se	0.90	0.016
Chromium	µg	30	Chromium	0.00	0.000	Chromium	0.00	0.000	Chromium	0.00	0.000
Iodine	µg	150	Iodine	0.00	0.000	Iodine	0.00	0.000	Iodine	0.00	0.000
Molybdenum	µg	45	Molybdenum	0.00	0.000	Molybdenum	0.00	0.000	Molybdenum	0.00	0.000
Chloride	g	2.3	Chloride	0.00	0.000	Chloride	0.00	0.000	Chloride	0.00	0.000
			Vitamins			**Vitamins**			**Vitamins**		
Vitamin C, total ascorbic acid	mg	82.5	Vitamin C, total ascorbic acid	6.70	0.081	Vitamin C, total ascorbic acid	8.70	0.105	Vitamin C, total ascorbic acid	9.90	0.120
Thiamin	mg	1.15	Thiamin	0.04	0.033	Thiamin	0.11	0.098	Thiamin	0.23	0.196
Riboflavin	mg	1.2	Riboflavin	0.04	0.032	Riboflavin	0.09	0.077	Riboflavin	0.08	0.067
Niacin	mg	15	Niacin	2.26	0.151	Niacin	2.37	0.158	Niacin	2.57	0.171
Pantothenic acid	mg	5	Pantothenic acid	1.34	0.267	Pantothenic acid	0.49	0.098	Pantothenic acid	1.04	0.208
Vitamin B-6	mg	1.3	Vitamin B-6	0.10	0.073	Vitamin B-6	0.23	0.175	Vitamin B-6	0.14	0.104
Folate, total	µg	400	Folate, total	97.00	0.243	Folate, total	49.00	0.123	Folate, total	61.00	0.153
Vitamin B-12	µg	2.4	Vitamin B-12	0.00	0.000	Vitamin B-12	0.00	0.000	Vitamin B-12	0.00	0.000
Vitamin A, RAE	mcg_RAE	800	Vitamin A, RAE	5.00	0.006	Vitamin A, RAE	14.00	0.018	Vitamin A, RAE	13.00	0.016
Vitamin E (alpha-tocopherol)	mg	15	Vitamin E (alpha-tocopherol)	0.08	0.005	Vitamin E (alpha-tocopherol)	0.11	0.007	Vitamin E (alpha-tocopherol)	0.10	0.007
Vitamin D (D2 + D3)	µg	15	Vitamin D (D2 + D3)	0.00	0.000	Vitamin D (D2 + D3)	0.00	0.000	Vitamin D (D2 + D3)	0.00	0.000
Vitamin K (phylloquinone)	µg	110	Vitamin K (phylloquinone)	0.00	0.000	Vitamin K (phylloquinone)	0.40	0.004	Vitamin K (phylloquinone)	0.40	0.004
Choline, total	mg	487.5	Choline, total	42.50	0.087	Choline, total	32.60	0.067	Choline, total	33.40	0.069
Biotin	µg	30	Biotin	0.00	0.000	Biotin	0.00	0.000	Biotin	0.00	0.000
Total Score					**0.013**			**0.012**			**0.014**

Carrots

	RDA		Carrots, canned, no salt added, drained solids			Carrots, frozen, unprepared			Carrots, raw		
			Unit 100 grams Edible Portion			Unit 100 grams Edible Portion			Unit 100 grams Edible Portion		
	Units		**Proximates**			**Proximates**			**Proximates**		
	kcal		Calories	25		Calories	36		Calories	41	
		Std.	**Minerals**		**Score**	**Minerals**		**Score**	**Minerals**		**Score**
Calcium, Ca	mg	1000	Calcium, Ca	25.00	0.025	Calcium, Ca	36.00	0.036	Calcium, Ca	33.00	0.033
Iron, Fe	mg	13	Iron, Fe	0.64	0.049	Iron, Fe	0.44	0.034	Iron, Fe	0.30	0.023
Magnesium, Mg	mg	370	Magnesium, Mg	8.00	0.022	Magnesium, Mg	12.00	0.032	Magnesium, Mg	12.00	0.032
Phosphorus, P	mg	700	Phosphorus, P	24.00	0.034	Phosphorus, P	33.00	0.047	Phosphorus, P	35.00	0.050
Potassium, K	mg	4700	Potassium, K	179.00	0.038	Potassium, K	235.00	0.050	Potassium, K	320.00	0.068
Sodium, Na	mg	1500	Sodium, Na	42.00	0.028	Sodium, Na	68.00	0.045	Sodium, Na	69.00	0.046
Zinc, Zn	mg	9.5	Zinc, Zn	0.26	0.027	Zinc, Zn	0.33	0.035	Zinc, Zn	0.24	0.025
Copper, Cu	mg	900	Copper, Cu	0.10	0.000	Copper, Cu	0.07	0.000	Copper, Cu	0.05	0.000
Manganese, Mn	mg	2.05	Manganese, Mn	0.45	0.220	Manganese, Mn	0.17	0.083	Manganese, Mn	0.14	0.070
Fluoride, F	µg	3500	Fluoride, F	46.10	0.013	Fluoride, F	19.90	0.006	Fluoride, F	3.20	0.001
Selenium, Se	µg	55	Selenium, Se	0.40	0.007	Selenium, Se	0.70	0.013	Selenium, Se	0.10	0.002
Chromium	µg	30	Chromium	0.00	0.000	Chromium	0.00	0.000	Chromium	0.00	0.000
Iodine	µg	150	Iodine	0.00	0.000	Iodine	0.00	0.000	Iodine	0.00	0.000
Molybdenum	µg	45	Molybdenum	0.00	0.000	Molybdenum	0.00	0.000	Molybdenum	0.00	0.000
Chloride	g	2.3	Chloride	0.00	0.000	Chloride	0.00	0.000	Chloride	0.00	0.000
			Vitamins			**Vitamins**			**Vitamins**		
Vitamin C, total ascorbic acid	mg	82.5	Vitamin C, total ascorbic acid	2.70	0.033	Vitamin C, total ascorbic acid	2.50	0.030	Vitamin C, total ascorbic acid	5.90	0.072
Thiamin	mg	1.15	Thiamin	0.02	0.016	Thiamin	0.04	0.038	Thiamin	0.07	0.057
Riboflavin	mg	1.2	Riboflavin	0.03	0.025	Riboflavin	0.04	0.031	Riboflavin	0.06	0.048
Niacin	mg	15	Niacin	0.55	0.037	Niacin	0.46	0.031	Niacin	0.98	0.066
Pantothenic acid	mg	5	Pantothenic acid	0.14	0.027	Pantothenic acid	0.19	0.037	Pantothenic acid	0.27	0.055
Vitamin B-6	mg	1.3	Vitamin B-6	0.11	0.086	Vitamin B-6	0.10	0.073	Vitamin B-6	0.14	0.106
Folate, total	µg	400	Folate, total	9.00	0.023	Folate, total	10.00	0.025	Folate, total	19.00	0.048
Vitamin B-12	µg	2.4	Vitamin B-12	0.00	0.000	Vitamin B-12	0.00	0.000	Vitamin B-12	0.00	0.000
Vitamin A, RAE	mcg_RAE	800	Vitamin A, RAE	558.00	0.698	Vitamin A, RAE	710.00	0.888	Vitamin A, RAE	835.00	1.044
Vitamin E (alpha-tocopherol)	mg	15	Vitamin E (alpha-tocopherol)	0.74	0.049	Vitamin E (alpha-tocopherol)	0.57	0.038	Vitamin E (alpha-tocopherol)	0.66	0.044
Vitamin D (D2 + D3)	µg	15	Vitamin D (D2 + D3)	0.00	0.000	Vitamin D (D2 + D3)	0.00	0.000	Vitamin D (D2 + D3)	0.00	0.000
Vitamin K (phylloquinone)	µg	110	Vitamin K (phylloquinone)	9.80	0.089	Vitamin K (phylloquinone)	17.60	0.160	Vitamin K (phylloquinone)	13.20	0.120
Choline, total	mg	487.5	Choline, total	0.00	0.000	Choline, total	7.50	0.015	Choline, total	8.80	0.018
Biotin	µg	30	Biotin	0.00	0.000	Biotin	0.00	0.000	Biotin	0.00	0.000
Total Score					**0.061**			**0.048**			**0.049**

Spinach

	RDA		Spinach, canned, regular pack, drained solids			Spinach, frozen, chopped or leaf, unprepared			Spinach, raw		
			Unit 100 grams Edible Portion			Unit 100 grams Edible Portion			Unit 100 grams Edible Portion		
	Units		**Proximates**			**Proximates**			**Proximates**		
	kcal		Calories	23		Calories	29		Calories	23	
		Std.	**Minerals**		**Score**	**Minerals**		**Score**	**Minerals**		**Score**
Calcium, Ca	mg	1000	Calcium, Ca	127.00	0.127	Calcium, Ca	129.00	0.129	Calcium, Ca	99.00	0.099
Iron, Fe	mg	13	Iron, Fe	2.30	0.177	Iron, Fe	1.89	0.145	Iron, Fe	2.71	0.208
Magnesium, Mg	mg	370	Magnesium, Mg	76.00	0.205	Magnesium, Mg	75.00	0.203	Magnesium, Mg	79.00	0.214
Phosphorus, P	mg	700	Phosphorus, P	44.00	0.063	Phosphorus, P	49.00	0.070	Phosphorus, P	49.00	0.070
Potassium, K	mg	4700	Potassium, K	346.00	0.074	Potassium, K	346.00	0.074	Potassium, K	558.00	0.119
Sodium, Na	mg	1500	Sodium, Na	322.00	0.215	Sodium, Na	74.00	0.049	Sodium, Na	79.00	0.053
Zinc, Zn	mg	9.5	Zinc, Zn	0.46	0.048	Zinc, Zn	0.56	0.059	Zinc, Zn	0.53	0.056
Copper, Cu	mg	900	Copper, Cu	0.18	0.000	Copper, Cu	0.14	0.000	Copper, Cu	0.13	0.000
Manganese, Mn	mg	2.05	Manganese, Mn	0.60	0.291	Manganese, Mn	0.70	0.343	Manganese, Mn	0.90	0.438
Fluoride, F	µg	3500	Fluoride, F	0.00	0.000	Fluoride, F	0.00	0.000	Fluoride, F	0.00	0.000
Selenium, Se	µg	55	Selenium, Se	1.40	0.025	Selenium, Se	6.00	0.109	Selenium, Se	1.00	0.018
Chromium	µg	30	Chromium	0.00	0.000	Chromium	0.00	0.000	Chromium	0.00	0.000
Iodine	µg	150	Iodine	0.00	0.000	Iodine	0.00	0.000	Iodine	0.00	0.000
Molybdenum	µg	45	Molybdenum	0.00	0.000	Molybdenum	0.00	0.000	Molybdenum	0.00	0.000
Chloride	g	2.3	Chloride	0.00	0.000	Chloride	0.00	0.000	Chloride	0.00	0.000
			Vitamins			**Vitamins**			**Vitamins**		
Vitamin C, total ascorbic acid	mg	82.5	Vitamin C, total ascorbic acid	14.30	0.173	Vitamin C, total ascorbic acid	5.50	0.067	Vitamin C, total ascorbic acid	28.10	0.341
Thiamin	mg	1.15	Thiamin	0.02	0.014	Thiamin	0.09	0.082	Thiamin	0.08	0.068
Riboflavin	mg	1.2	Riboflavin	0.14	0.115	Riboflavin	0.22	0.187	Riboflavin	0.19	0.158
Niacin	mg	15	Niacin	0.39	0.026	Niacin	0.51	0.034	Niacin	0.72	0.048
Pantothenic acid	mg	5	Pantothenic acid	0.05	0.009	Pantothenic acid	0.09	0.019	Pantothenic acid	0.07	0.013
Vitamin B-6	mg	1.3	Vitamin B-6	0.10	0.077	Vitamin B-6	0.17	0.132	Vitamin B-6	0.20	0.150
Folate, total	µg	400	Folate, total	98.00	0.245	Folate, total	145.00	0.363	Folate, total	194.00	0.485
Vitamin B-12	µg	2.4	Vitamin B-12	0.00	0.000	Vitamin B-12	0.00	0.000	Vitamin B-12	0.00	0.000
Vitamin A, RAE	mcg_RAE	800	Vitamin A, RAE	490.00	0.613	Vitamin A, RAE	586.00	0.733	Vitamin A, RAE	469.00	0.586
Vitamin E (alpha-tocopherol)	mg	15	Vitamin E (alpha-tocopherol)	1.94	0.129	Vitamin E (alpha-tocopherol)	2.90	0.193	Vitamin E (alpha-tocopherol)	2.03	0.135
Vitamin D (D2 + D3)	µg	15	Vitamin D (D2 + D3)	0.00	0.000	Vitamin D (D2 + D3)	0.00	0.000	Vitamin D (D2 + D3)	0.00	0.000
Vitamin K (phylloquinone)	µg	110	Vitamin K (phylloquinone)	461.60	4.196	Vitamin K (phylloquinone)	372.00	3.382	Vitamin K (phylloquinone)	482.90	4.390
Choline, total	mg	487.5	Choline, total	0.00	0.000	Choline, total	0.00	0.000	Choline, total	0.00	0.000
Biotin	µg	30	Biotin	0.00	0.000	Biotin	0.00	0.000	Biotin	0.00	0.000
Total Score					**0.298**			**0.221**			**0.334**

Turnip Greens

	RDA		Turnip greens, canned, solids and liquids			Turnip greens, frozen, unprepared			Turnip greens, raw		
			Unit 100 grams Edible Portion			Unit 100 grams Edible Portion			Unit 100 grams Edible Portion		
	Units		**Proximates**			**Proximates**			**Proximates**		
	kcal		Calories	14		Calories	22		Calories	32	
		Std.	**Minerals**		**Score**	**Minerals**		**Score**	**Minerals**		**Score**
Calcium, Ca	mg	1000	Calcium, Ca	127.00	0.127	Calcium, Ca	129.00	0.129	Calcium, Ca	99.00	0.099
Iron, Fe	mg	13	Iron, Fe	2.30	0.177	Iron, Fe	1.89	0.145	Iron, Fe	2.71	0.208
Magnesium, Mg	mg	370	Magnesium, Mg	76.00	0.205	Magnesium, Mg	75.00	0.203	Magnesium, Mg	79.00	0.214
Phosphorus, P	mg	700	Phosphorus, P	44.00	0.063	Phosphorus, P	49.00	0.070	Phosphorus, P	49.00	0.070
Potassium, K	mg	4700	Potassium, K	346.00	0.074	Potassium, K	346.00	0.074	Potassium, K	558.00	0.119
Sodium, Na	mg	1500	Sodium, Na	322.00	0.215	Sodium, Na	74.00	0.049	Sodium, Na	79.00	0.053
Zinc, Zn	mg	9.5	Zinc, Zn	0.46	0.048	Zinc, Zn	0.56	0.059	Zinc, Zn	0.53	0.056
Copper, Cu	mg	900	Copper, Cu	0.18	0.000	Copper, Cu	0.14	0.000	Copper, Cu	0.13	0.000
Manganese, Mn	mg	2.05	Manganese, Mn	0.60	0.291	Manganese, Mn	0.70	0.343	Manganese, Mn	0.90	0.438
Fluoride, F	µg	3500	Fluoride, F	0.00	0.000	Fluoride, F	0.00	0.000	Fluoride, F	0.00	0.000
Selenium, Se	µg	55	Selenium, Se	1.40	0.025	Selenium, Se	6.00	0.109	Selenium, Se	1.00	0.018
Chromium	µg	30	Chromium	0.00	0.000	Chromium	0.00	0.000	Chromium	0.00	0.000
Iodine	µg	150	Iodine	0.00	0.000	Iodine	0.00	0.000	Iodine	0.00	0.000
Molybdenum	µg	45	Molybdenum	0.00	0.000	Molybdenum	0.00	0.000	Molybdenum	0.00	0.000
Chloride	g	2.3	Chloride	0.00	0.000	Chloride	0.00	0.000	Chloride	0.00	0.000
			Vitamins			**Vitamins**			**Vitamins**		
Vitamin C, total ascorbic acid	mg	82.5	Vitamin C, total ascorbic acid	15.50	0.188	Vitamin C, total ascorbic acid	26.80	0.325	Vitamin C, total ascorbic acid	60.00	0.727
Thiamin	mg	1.15	Thiamin	0.01	0.010	Thiamin	0.04	0.038	Thiamin	0.07	0.061
Riboflavin	mg	1.2	Riboflavin	0.06	0.053	Riboflavin	0.09	0.076	Riboflavin	0.10	0.083
Niacin	mg	15	Niacin	0.36	0.024	Niacin	0.38	0.026	Niacin	0.60	0.040
Pantothenic acid	mg	5	Pantothenic acid	0.04	0.008	Pantothenic acid	0.14	0.028	Pantothenic acid	0.38	0.076
Vitamin B-6	mg	1.3	Vitamin B-6	0.04	0.028	Vitamin B-6	0.10	0.077	Vitamin B-6	0.26	0.202
Folate, total	µg	400	Folate, total	41.00	0.103	Folate, total	74.00	0.185	Folate, total	194.00	0.485
Vitamin B-12	µg	2.4	Vitamin B-12	0.00	0.000	Vitamin B-12	0.00	0.000	Vitamin B-12	0.00	0.000
Vitamin A, RAE	mcg_RAE	800	Vitamin A, RAE	179.00	0.224	Vitamin A, RAE	309.00	0.386	Vitamin A, RAE	579.00	0.724
Vitamin E (alpha-tocopherol)	mg	15	Vitamin E (alpha-tocopherol)	0.00	0.000	Vitamin E (alpha-tocopherol)	0.00	0.000	Vitamin E (alpha-tocopherol)	2.86	0.191
Vitamin D (D2 + D3)	µg	15	Vitamin D (D2 + D3)	0.00	0.000	Vitamin D (D2 + D3)	0.00	0.000	Vitamin D (D2 + D3)	0.00	0.000
Vitamin K (phylloquinone)	µg	110	Vitamin K (phylloquinone)	0.00	0.000	Vitamin K (phylloquinone)	0.00	0.000	Vitamin K (phylloquinone)	251.00	2.282
Choline, total	mg	487.5	Choline, total	0.00	0.000	Choline, total	0.00	0.000	Choline, total	0.00	0.000
Biotin	µg	30	Biotin	0.00	0.000	Biotin	0.00	0.000	Biotin	0.00	0.000
Total Score					**0.096**			**0.079**			**0.177**

Green Beans

	RDA		Beans, snap, green variety, canned, regular pack, solids and liquids			Beans, snap, green, frozen, all styles, unprepared			Beans, snap, green, raw		
			Unit 100 grams Edible Portion			Unit 100 grams Edible Portion			Unit 100 grams Edible Portion		
	Units		**Proximates**			**Proximates**			**Proximates**		
	kcal		Calories	15		Calories	39		Calories	31	
		Std.	**Minerals**		**Score**	**Minerals**		**Score**	**Minerals**		**Score**
Calcium, Ca	mg	1000	Calcium, Ca	29.00	0.029	Calcium, Ca	42.00	0.042	Calcium, Ca	37.00	0.037
Iron, Fe	mg	13	Iron, Fe	1.02	0.078	Iron, Fe	0.85	0.065	Iron, Fe	1.03	0.079
Magnesium, Mg	mg	370	Magnesium, Mg	13.00	0.035	Magnesium, Mg	22.00	0.059	Magnesium, Mg	25.00	0.068
Phosphorus, P	mg	700	Phosphorus, P	18.00	0.026	Phosphorus, P	32.00	0.046	Phosphorus, P	38.00	0.054
Potassium, K	mg	4700	Potassium, K	92.00	0.020	Potassium, K	186.00	0.040	Potassium, K	211.00	0.045
Sodium, Na	mg	1500	Sodium, Na	192.00	0.128	Sodium, Na	3.00	0.002	Sodium, Na	6.00	0.004
Zinc, Zn	mg	9.5	Zinc, Zn	0.36	0.038	Zinc, Zn	0.26	0.027	Zinc, Zn	0.24	0.025
Copper, Cu	mg	900	Copper, Cu	0.04	0.000	Copper, Cu	0.05	0.000	Copper, Cu	0.07	0.000
Manganese, Mn	mg	2.05	Manganese, Mn	0.21	0.100	Manganese, Mn	0.37	0.180	Manganese, Mn	0.22	0.105
Fluoride, F	µg	3500	Fluoride, F	0.00	0.000	Fluoride, F	0.00	0.000	Fluoride, F	19.00	0.000
Selenium, Se	µg	55	Selenium, Se	0.00	0.000	Selenium, Se	0.60	0.011	Selenium, Se	0.60	0.011
Chromium	µg	30	Chromium	0.00	0.000	Chromium	0.00	0.000	Chromium	0.00	0.000
Iodine	µg	150	Iodine	0.00	0.000	Iodine	0.00	0.000	Iodine	0.00	0.000
Molybdenum	µg	45	Molybdenum	0.00	0.000	Molybdenum	0.00	0.000	Molybdenum	0.00	0.000
Chloride	g	2.3	Chloride	0.00	0.000	Chloride	0.00	0.000	Chloride	0.00	0.000
			Vitamins			**Vitamins**			**Vitamins**		
Vitamin C, total ascorbic acid	mg	82.5	Vitamin C, total ascorbic acid	2.20	0.027	Vitamin C, total ascorbic acid	12.90	0.156	Vitamin C, total ascorbic acid	12.20	0.148
Thiamin	mg	1.15	Thiamin	0.02	0.013	Thiamin	0.10	0.085	Thiamin	0.08	0.071
Riboflavin	mg	1.2	Riboflavin	0.02	0.017	Riboflavin	0.09	0.076	Riboflavin	0.10	0.087
Niacin	mg	15	Niacin	0.20	0.013	Niacin	0.50	0.033	Niacin	0.73	0.049
Pantothenic acid	mg	5	Pantothenic acid	0.11	0.021	Pantothenic acid	0.10	0.021	Pantothenic acid	0.23	0.045
Vitamin B-6	mg	1.3	Vitamin B-6	0.03	0.023	Vitamin B-6	0.04	0.034	Vitamin B-6	0.14	0.108
Folate, total	µg	400	Folate, total	26.00	0.065	Folate, total	15.00	0.038	Folate, total	33.00	0.083
Vitamin B-12	µg	2.4	Vitamin B-12	0.00	0.000	Vitamin B-12	0.00	0.000	Vitamin B-12	0.00	0.000
Vitamin A, RAE	mcg_RAE	800	Vitamin A, RAE	16.00	0.020	Vitamin A, RAE	27.00	0.034	Vitamin A, RAE	35.00	0.044
Vitamin E (alpha-tocopherol)	mg	15	Vitamin E (alpha-tocopherol)	0.21	0.014	Vitamin E (alpha-tocopherol)	0.42	0.028	Vitamin E (alpha-tocopherol)	0.41	0.027
Vitamin D (D2 + D3)	µg	15	Vitamin D (D2 + D3)	0.00	0.000	Vitamin D (D2 + D3)	0.00	0.000	Vitamin D (D2 + D3)	0.00	0.000
Vitamin K (phylloquinone)	µg	110	Vitamin K (phylloquinone)	7.30	0.066	Vitamin K (phylloquinone)	44.80	0.407	Vitamin K (phylloquinone)	14.40	0.131
Choline, total	mg	487.5	Choline, total	0.00	0.000	Choline, total	0.00	0.000	Choline, total	0.00	0.000
Biotin	µg	30	Biotin	0.00	0.000	Biotin	0.00	0.000	Biotin	0.00	0.000
Total Score					**0.049**			**0.035**			**0.039**

Peas

	RDA		Peas, green, canned, regular pack, solids and liquids			Peas, green, frozen, unprepared			Peas, green, raw		
			Unit 100 grams Edible Portion			Unit 100 grams Edible Portion			Unit 100 grams Edible Portion		
	Units		**Proximates**			**Proximates**			**Proximates**		
	kcal		Calories	58		Calories	77		Calories	81	
		Std.	**Minerals**		**Score**	**Minerals**		**Score**	**Minerals**		**Score**
Calcium, Ca	mg	1000	Calcium, Ca	20.00	0.020	Calcium, Ca	22.00	0.022	Calcium, Ca	25.00	0.025
Iron, Fe	mg	13	Iron, Fe	1.29	0.099	Iron, Fe	1.53	0.118	Iron, Fe	1.47	0.113
Magnesium, Mg	mg	370	Magnesium, Mg	19.00	0.051	Magnesium, Mg	26.00	0.070	Magnesium, Mg	33.00	0.089
Phosphorus, P	mg	700	Phosphorus, P	63.00	0.090	Phosphorus, P	82.00	0.117	Phosphorus, P	108.00	0.154
Potassium, K	mg	4700	Potassium, K	106.00	0.023	Potassium, K	153.00	0.033	Potassium, K	244.00	0.052
Sodium, Na	mg	1500	Sodium, Na	185.00	0.123	Sodium, Na	108.00	0.072	Sodium, Na	5.00	0.003
Zinc, Zn	mg	9.5	Zinc, Zn	0.72	0.076	Zinc, Zn	0.82	0.086	Zinc, Zn	1.24	0.131
Copper, Cu	mg	900	Copper, Cu	0.10	0.000	Copper, Cu	0.12	0.000	Copper, Cu	0.18	0.000
Manganese, Mn	mg	2.05	Manganese, Mn	0.21	0.103	Manganese, Mn	0.34	0.164	Manganese, Mn	0.41	0.200
Fluoride, F	µg	3500	Fluoride, F	0.00	0.000	Fluoride, F	0.00	0.000	Fluoride, F	0.00	0.000
Selenium, Se	µg	55	Selenium, Se	1.30	0.024	Selenium, Se	1.90	0.035	Selenium, Se	1.80	0.033
Chromium	µg	30	Chromium	0.00	0.000	Chromium	0.00	0.000	Chromium	0.00	0.000
Iodine	µg	150	Iodine	0.00	0.000	Iodine	0.00	0.000	Iodine	0.00	0.000
Molybdenum	µg	45	Molybdenum	0.00	0.000	Molybdenum	0.00	0.000	Molybdenum	0.00	0.000
Chloride	g	2.3	Chloride	0.00	0.000	Chloride	0.00	0.000	Chloride	0.00	0.000
			Vitamins			**Vitamins**			**Vitamins**		
Vitamin C, total ascorbic acid	mg	82.5	Vitamin C, total ascorbic acid	7.80	0.095	Vitamin C, total ascorbic acid	18.00	0.218	Vitamin C, total ascorbic acid	40.00	0.485
Thiamin	mg	1.15	Thiamin	0.08	0.067	Thiamin	0.26	0.225	Thiamin	0.27	0.231
Riboflavin	mg	1.2	Riboflavin	0.02	0.020	Riboflavin	0.10	0.083	Riboflavin	0.13	0.110
Niacin	mg	15	Niacin	1.00	0.066	Niacin	1.72	0.115	Niacin	2.09	0.139
Pantothenic acid	mg	5	Pantothenic acid	0.09	0.018	Pantothenic acid	0.55	0.109	Pantothenic acid	0.10	0.021
Vitamin B-6	mg	1.3	Vitamin B-6	0.07	0.050	Vitamin B-6	0.08	0.064	Vitamin B-6	0.17	0.130
Folate, total	µg	400	Folate, total	24.00	0.060	Folate, total	53.00	0.133	Folate, total	65.00	0.163
Vitamin B-12	µg	2.4	Vitamin B-12	0.00	0.000	Vitamin B-12	0.00	0.000	Vitamin B-12	0.00	0.000
Vitamin A, RAE	mcg_RAE	800	Vitamin A, RAE	76.00	0.095	Vitamin A, RAE	103.00	0.129	Vitamin A, RAE	38.00	0.048
Vitamin E (alpha-tocopherol)	mg	15	Vitamin E (alpha-tocopherol)	0.02	0.001	Vitamin E (alpha-tocopherol)	0.02	0.001	Vitamin E (alpha-tocopherol)	0.13	0.009
Vitamin D (D2 + D3)	µg	15	Vitamin D (D2 + D3)	0.00	0.000	Vitamin D (D2 + D3)	0.00	0.000	Vitamin D (D2 + D3)	0.00	0.000
Vitamin K (phylloquinone)	µg	110	Vitamin K (phylloquinone)	20.70	0.188	Vitamin K (phylloquinone)	27.90	0.254	Vitamin K (phylloquinone)	24.80	0.225
Choline, total	mg	487.5	Choline, total	20.00	0.041	Choline, total	27.00	0.055	Choline, total	28.40	0.058
Biotin	µg	30	Biotin	0.00	0.000	Biotin	0.00	0.000	Biotin	0.00	0.000
Total Score					**0.023**			**0.027**			**0.030**

Asparagus

	RDA		Asparagus, canned, regular pack, solids and liquids			Asparagus, frozen, unprepared			Asparagus, raw		
			Unit 100 grams Edible Portion			Unit 100 grams Edible Portion			Unit 100 grams Edible Portion		
	Units		**Proximates**			**Proximates**			**Proximates**		
	kcal		Calories	15		Calories	24		Calories	20	
		Std.	**Minerals**		**Score**	**Minerals**		**Score**	**Minerals**		**Score**
Calcium, Ca	mg	1000	Calcium, Ca	15.00	0.015	Calcium, Ca	25.00	0.025	Calcium, Ca	24.00	0.024
Iron, Fe	mg	13	Iron, Fe	0.60	0.046	Iron, Fe	0.73	0.056	Iron, Fe	2.14	0.165
Magnesium, Mg	mg	370	Magnesium, Mg	9.00	0.024	Magnesium, Mg	14.00	0.038	Magnesium, Mg	14.00	0.038
Phosphorus, P	mg	700	Phosphorus, P	38.00	0.054	Phosphorus, P	64.00	0.091	Phosphorus, P	52.00	0.074
Potassium, K	mg	4700	Potassium, K	172.00	0.037	Potassium, K	253.00	0.054	Potassium, K	202.00	0.043
Sodium, Na	mg	1500	Sodium, Na	284.00	0.189	Sodium, Na	8.00	0.005	Sodium, Na	2.00	0.001
Zinc, Zn	mg	9.5	Zinc, Zn	0.47	0.049	Zinc, Zn	0.59	0.062	Zinc, Zn	0.54	0.057
Copper, Cu	mg	900	Copper, Cu	0.11	0.000	Copper, Cu	0.14	0.000	Copper, Cu	0.19	0.000
Manganese, Mn	mg	2.05	Manganese, Mn	0.15	0.074	Manganese, Mn	0.20	0.099	Manganese, Mn	0.16	0.077
Fluoride, F	µg	3500	Fluoride, F	0.00	0.000	Fluoride, F	0.00	0.000	Fluoride, F	0.00	0.000
Selenium, Se	µg	55	Selenium, Se	1.60	0.029	Selenium, Se	1.70	0.031	Selenium, Se	2.30	0.042
Chromium	µg	30	Chromium	0.00	0.000	Chromium	0.00	0.000	Chromium	0.00	0.000
Iodine	µg	150	Iodine	0.00	0.000	Iodine	0.00	0.000	Iodine	0.00	0.000
Molybdenum	µg	45	Molybdenum	0.00	0.000	Molybdenum	0.00	0.000	Molybdenum	0.00	0.000
Chloride	g	2.3	Chloride	0.00	0.000	Chloride	0.00	0.000	Chloride	0.00	0.000
			Vitamins			**Vitamins**			**Vitamins**		
Vitamin C, total ascorbic acid	mg	82.5	Vitamin C, total ascorbic acid	16.50	0.200	Vitamin C, total ascorbic acid	31.80	0.385	Vitamin C, total ascorbic acid	5.60	0.068
Thiamin	mg	1.15	Thiamin	0.05	0.047	Thiamin	0.12	0.105	Thiamin	0.14	0.124
Riboflavin	mg	1.2	Riboflavin	0.09	0.074	Riboflavin	0.13	0.109	Riboflavin	0.14	0.118
Niacin	mg	15	Niacin	0.85	0.057	Niacin	1.20	0.080	Niacin	0.98	0.065
Pantothenic acid	mg	5	Pantothenic acid	0.12	0.025	Pantothenic acid	0.18	0.037	Pantothenic acid	0.27	0.055
Vitamin B-6	mg	1.3	Vitamin B-6	0.10	0.075	Vitamin B-6	0.11	0.085	Vitamin B-6	0.09	0.070
Folate, total	µg	400	Folate, total	85.00	0.213	Folate, total	191.00	0.478	Folate, total	52.00	0.130
Vitamin B-12	µg	2.4	Vitamin B-12	0.00	0.000	Vitamin B-12	0.00	0.000	Vitamin B-12	0.00	0.000
Vitamin A, RAE	mcg_RAE	800	Vitamin A, RAE	26.00	0.033	Vitamin A, RAE	47.00	0.059	Vitamin A, RAE	38.00	0.048
Vitamin E (alpha-tocopherol)	mg	15	Vitamin E (alpha-tocopherol)	0.00	0.000	Vitamin E (alpha-tocopherol)	0.00	0.000	Vitamin E (alpha-tocopherol)	1.13	0.075
Vitamin D (D2 + D3)	µg	15	Vitamin D (D2 + D3)	0.00	0.000	Vitamin D (D2 + D3)	0.00	0.000	Vitamin D (D2 + D3)	0.00	0.000
Vitamin K (phylloquinone)	µg	110	Vitamin K (phylloquinone)	0.00	0.000	Vitamin K (phylloquinone)	0.00	0.000	Vitamin K (phylloquinone)	41.60	0.378
Choline, total	mg	487.5	Choline, total	0.00	0.000	Choline, total	0.00	0.000	Choline, total	16.00	0.033
Biotin	µg	30	Biotin	0.00	0.000	Biotin	0.00	0.000	Biotin	0.00	0.000
Total Score					**0.083**			**0.075**			**0.084**

Tomatoes

	RDA		Tomatoes, crushed, canned				Tomatoes, red, ripe, raw, year round average		
			Unit 100 Grams Edible Portion				Unit 100 Grams Edible Portion		
	Units		**Proximates**				**Proximates**		
	kcal		Calories	32			Calories	18	
		Std.	**Minerals**		**Score**		**Minerals**		**Score**
Calcium, Ca	mg	1000	Calcium, Ca	34.00	0.034		Calcium, Ca	10.00	0.010
Iron, Fe	mg	13	Iron, Fe	1.30	0.100		Iron, Fe	0.27	0.021
Magnesium, Mg	mg	370	Magnesium, Mg	20.00	0.054		Magnesium, Mg	11.00	0.030
Phosphorus, P	mg	700	Phosphorus, P	32.00	0.046		Phosphorus, P	24.00	0.034
Potassium, K	mg	4700	Potassium, K	293.00	0.062		Potassium, K	237.00	0.050
Sodium, Na	mg	1500	Sodium, Na	132.00	0.088		Sodium, Na	5.00	0.003
Zinc, Zn	mg	9.5	Zinc, Zn	0.27	0.028		Zinc, Zn	0.17	0.018
Copper, Cu	mg	900	Copper, Cu	0.18	0.000		Copper, Cu	0.06	0.000
Manganese, Mn	mg	2.05	Manganese, Mn	0.18	0.089		Manganese, Mn	0.11	0.056
Fluoride, F	µg	3500	Fluoride, F	0.60	0.000		Fluoride, F	2.30	0.001
Selenium, Se	µg	55	Selenium, Se	0.00	0.000		Selenium, Se	0.00	0.000
Chromium	µg	30	Chromium	0.00	0.000		Chromium	0.00	0.000
Iodine	µg	150	Iodine	0.00	0.000		Iodine	0.00	0.000
Molybdenum	µg	45	Molybdenum	0.00	0.000		Molybdenum	0.00	0.000
Chloride	g	2.3	Chloride	0.00	0.000		Chloride	0.00	0.000
			Vitamins				**Vitamins**		
Vitamin C, total ascorbic acid	mg	82.5	Vitamin C, total ascorbic acid	9.20	0.112		Vitamin C, total ascorbic acid	13.70	0.166
Thiamin	mg	1.15	Thiamin	0.08	0.065		Thiamin	0.04	0.032
Riboflavin	mg	1.2	Riboflavin	0.05	0.043		Riboflavin	0.02	0.016
Niacin	mg	15	Niacin	1.22	0.081		Niacin	0.59	0.040
Pantothenic acid	mg	5	Pantothenic acid	0.28	0.056		Pantothenic acid	0.09	0.018
Vitamin B-6	mg	1.3	Vitamin B-6	0.15	0.115		Vitamin B-6	0.08	0.062
Folate, total	µg	400	Folate, total	13.00	0.033		Folate, total	15.00	0.038
Vitamin B-12	µg	2.4	Vitamin B-12	0.00	0.000		Vitamin B-12	0.00	0.000
Vitamin A, RAE	mcg_RAE	800	Vitamin A, RAE	11.00	0.014		Vitamin A, RAE	42.00	0.053
Vitamin E (alpha-tocopherol)	mg	15	Vitamin E (alpha-tocopherol)	1.25	0.083		Vitamin E (alpha-tocopherol)	0.54	0.036
Vitamin D (D2 + D3)	µg	15	Vitamin D (D2 + D3)	0.00	0.000		Vitamin D (D2 + D3)	0.00	0.000
Vitamin K (phylloquinone)	µg	110	Vitamin K (phylloquinone)	5.30	0.048		Vitamin K (phylloquinone)	7.90	0.072
Choline, total	mg	487.5	Choline, total	12.90	0.026		Choline, total	6.70	0.014
Biotin	µg	30	Biotin	0.00	0.000		Biotin	0.00	0.000
Total Score					**0.037**				**0.043**

Peaches

	RDA		Peaches, canned, water pack, solids and liquids			Peaches, frozen, sliced, sweetened			Peaches, raw		
			Unit 100 grams Edible Portion			Unit 100 grams Edible Portion			Unit 100 grams Edible Portion		
	Units		**Proximates**			**Proximates**			**Proximates**		
	kcal		Calories	24		Calories	94		Calories	39	
		Std.	**Minerals**		**Score**	**Minerals**		**Score**	**Minerals**		**Score**
Calcium, Ca	mg	1000	Calcium, Ca	2.00	0.002	Calcium, Ca	3.00	0.003	Calcium, Ca	6.00	0.006
Iron, Fe	mg	13	Iron, Fe	0.32	0.025	Iron, Fe	0.37	0.028	Iron, Fe	0.25	0.019
Magnesium, Mg	mg	370	Magnesium, Mg	5.00	0.014	Magnesium, Mg	5.00	0.014	Magnesium, Mg	9.00	0.024
Phosphorus, P	mg	700	Phosphorus, P	10.00	0.014	Phosphorus, P	11.00	0.016	Phosphorus, P	20.00	0.029
Potassium, K	mg	4700	Potassium, K	99.00	0.021	Potassium, K	130.00	0.028	Potassium, K	190.00	0.040
Sodium, Na	mg	1500	Sodium, Na	3.00	0.002	Sodium, Na	6.00	0.004	Sodium, Na	0.00	0.000
Zinc, Zn	mg	9.5	Zinc, Zn	0.09	0.009	Zinc, Zn	0.05	0.005	Zinc, Zn	0.17	0.018
Copper, Cu	mg	900	Copper, Cu	0.05	0.000	Copper, Cu	0.02	0.000	Copper, Cu	0.07	0.000
Manganese, Mn	mg	2.05	Manganese, Mn	0.05	0.023	Manganese, Mn	0.03	0.014	Manganese, Mn	0.06	0.030
Fluoride, F	µg	3500	Fluoride, F	0.00	0.000	Fluoride, F	0.00	0.000	Fluoride, F	4.00	0.001
Selenium, Se	µg	55	Selenium, Se	0.30	0.005	Selenium, Se	0.40	0.007	Selenium, Se	0.10	0.002
Chromium	µg	30	Chromium	0.00	0.000	Chromium	0.00	0.000	Chromium	0.00	0.000
Iodine	µg	150	Iodine	0.00	0.000	Iodine	0.00	0.000	Iodine	0.00	0.000
Molybdenum	µg	45	Molybdenum	0.00	0.000	Molybdenum	0.00	0.000	Molybdenum	0.00	0.000
Chloride	g	2.3	Chloride	0.00	0.000	Chloride	0.00	0.000	Chloride	0.00	0.000
			Vitamins			**Vitamins**			**Vitamins**		
Vitamin C, total ascorbic acid	mg	82.5	Vitamin C, total ascorbic acid	2.90	0.035	Vitamin C, total ascorbic acid	94.20	1.142	Vitamin C, total ascorbic acid	6.60	0.080
Thiamin	mg	1.15	Thiamin	0.01	0.008	Thiamin	0.01	0.011	Thiamin	0.02	0.021
Riboflavin	mg	1.2	Riboflavin	0.02	0.016	Riboflavin	0.04	0.029	Riboflavin	0.03	0.026
Niacin	mg	15	Niacin	0.52	0.035	Niacin	0.65	0.044	Niacin	0.81	0.054
Pantothenic acid	mg	5	Pantothenic acid	0.05	0.010	Pantothenic acid	0.13	0.026	Pantothenic acid	0.15	0.031
Vitamin B-6	mg	1.3	Vitamin B-6	0.02	0.015	Vitamin B-6	0.02	0.014	Vitamin B-6	0.03	0.019
Folate, total	µg	400	Folate, total	3.00	0.008	Folate, total	3.00	0.008	Folate, total	4.00	0.010
Vitamin B-12	µg	2.4	Vitamin B-12	0.00	0.000	Vitamin B-12	0.00	0.000	Vitamin B-12	0.00	0.000
Vitamin A, RAE	mcg_RAE	800	Vitamin A, RAE	27.00	0.034	Vitamin A, RAE	14.00	0.018	Vitamin A, RAE	16.00	0.020
Vitamin E (alpha-tocopherol)	mg	15	Vitamin E (alpha-tocopherol)	0.49	0.033	Vitamin E (alpha-tocopherol)	0.62	0.041	Vitamin E (alpha-tocopherol)	0.73	0.049
Vitamin D (D2 + D3)	µg	15	Vitamin D (D2 + D3)	0.00	0.000	Vitamin D (D2 + D3)	0.00	0.000	Vitamin D (D2 + D3)	0.00	0.000
Vitamin K (phylloquinone)	µg	110	Vitamin K (phylloquinone)	1.70	0.015	Vitamin K (phylloquinone)	2.20	0.020	Vitamin K (phylloquinone)	2.60	0.024
Choline, total	mg	487.5	Choline, total	4.10	0.008	Choline, total	5.10	0.010	Choline, total	6.10	0.013
Biotin	µg	30	Biotin	0.00	0.000	Biotin	0.00	0.000	Biotin	0.00	0.000
Total Score					**0.014**			**0.016**			**0.013**

Strawberries

	RDA		Strawberries, canned, heavy syrup pack, solids and liquids			Strawberries, frozen, unsweetened			Strawberries, raw		
			Unit 100 Grams Edible Portion			Unit 100 Grams Edible Portion			Unit 100 Grams Edible Portion		
	Units		**Proximates**			**Proximates**			**Proximates**		
	kcal		Calories	92		Calories	35		Calories	32	
		Std.	**Minerals**		**Score**	**Minerals**		**Score**	**Minerals**		**Score**
Calcium, Ca	mg	1000	Calcium, Ca	13.00	0.013	Calcium, Ca	16.00	0.016	Calcium, Ca	16.00	0.016
Iron, Fe	mg	13	Iron, Fe	0.49	0.038	Iron, Fe	0.75	0.058	Iron, Fe	0.41	0.032
Magnesium, Mg	mg	370	Magnesium, Mg	8.00	0.022	Magnesium, Mg	11.00	0.030	Magnesium, Mg	13.00	0.035
Phosphorus, P	mg	700	Phosphorus, P	12.00	0.017	Phosphorus, P	13.00	0.019	Phosphorus, P	24.00	0.034
Potassium, K	mg	4700	Potassium, K	86.00	0.018	Potassium, K	148.00	0.031	Potassium, K	153.00	0.033
Sodium, Na	mg	1500	Sodium, Na	4.00	0.003	Sodium, Na	2.00	0.001	Sodium, Na	1.00	0.001
Zinc, Zn	mg	9.5	Zinc, Zn	0.09	0.009	Zinc, Zn	0.13	0.014	Zinc, Zn	0.14	0.015
Copper, Cu	mg	900	Copper, Cu	0.06	0.000	Copper, Cu	0.05	0.000	Copper, Cu	0.05	0.000
Manganese, Mn	mg	2.05	Manganese, Mn	0.20	0.098	Manganese, Mn	0.29	0.141	Manganese, Mn	0.39	0.188
Fluoride, F	µg	3500	Fluoride, F	0.00	0.000	Fluoride, F	0.00	0.000	Fluoride, F	4.40	0.001
Selenium, Se	µg	55	Selenium, Se	0.30	0.005	Selenium, Se	0.70	0.013	Selenium, Se	0.40	0.007
Chromium	µg	30	Chromium	0.00	0.000	Chromium	0.00	0.000	Chromium	0.00	0.000
Iodine	µg	150	Iodine	0.00	0.000	Iodine	0.00	0.000	Iodine	0.00	0.000
Molybdenum	µg	45	Molybdenum	0.00	0.000	Molybdenum	0.00	0.000	Molybdenum	0.00	0.000
Chloride	g	2.3	Chloride	0.00	0.000	Chloride	0.00	0.000	Chloride	0.00	0.000
			Vitamins			**Vitamins**			**Vitamins**		
Vitamin C, total ascorbic acid	mg	82.5	Vitamin C, total ascorbic acid	31.70	0.384	Vitamin C, total ascorbic acid	41.20	0.499	Vitamin C, total ascorbic acid	58.80	0.713
Thiamin	mg	1.15	Thiamin	0.02	0.018	Thiamin	0.02	0.019	Thiamin	0.02	0.021
Riboflavin	mg	1.2	Riboflavin	0.03	0.028	Riboflavin	0.04	0.031	Riboflavin	0.02	0.018
Niacin	mg	15	Niacin	0.06	0.004	Niacin	0.46	0.031	Niacin	0.39	0.026
Pantothenic acid	mg	5	Pantothenic acid	0.18	0.036	Pantothenic acid	0.11	0.022	Pantothenic acid	0.13	0.025
Vitamin B-6	mg	1.3	Vitamin B-6	0.05	0.038	Vitamin B-6	0.03	0.022	Vitamin B-6	0.05	0.036
Folate, total	µg	400	Folate, total	28.00	0.070	Folate, total	17.00	0.043	Folate, total	24.00	0.060
Vitamin B-12	µg	2.4	Vitamin B-12	0.00	0.000	Vitamin B-12	0.00	0.000	Vitamin B-12	0.00	0.000
Vitamin A, RAE	mcg_RAE	800	Vitamin A, RAE	1.00	0.001	Vitamin A, RAE	2.00	0.003	Vitamin A, RAE	1.00	0.001
Vitamin E (alpha-tocopherol)	mg	15	Vitamin E (alpha-tocopherol)	0.19	0.013	Vitamin E (alpha-tocopherol)	0.29	0.019	Vitamin E (alpha-tocopherol)	0.29	0.019
Vitamin D (D2 + D3)	µg	15	Vitamin D (D2 + D3)	0.00	0.000	Vitamin D (D2 + D3)	0.00	0.000	Vitamin D (D2 + D3)	0.00	0.000
Vitamin K (phylloquinone)	µg	110	Vitamin K (phylloquinone)	1.50	0.014	Vitamin K (phylloquinone)	2.20	0.020	Vitamin K (phylloquinone)	2.20	0.020
Choline, total	mg	487.5	Choline, total	3.80	0.008	Choline, total	5.70	0.012	Choline, total	5.70	0.012
Biotin	µg	30	Biotin	0.00	0.000	Biotin	0.00	0.000	Biotin	0.00	0.000
Total Score					**0.009**			**0.030**			**0.041**

BlueBerries

	RDA		Blueberries, canned, heavy syrup, solids and liquids			Blueberries, frozen, unsweetened			Blueberries, raw		
			Unit 100 Grams Edible Portion			Unit 100 Grams Edible Portion			Unit 100 Grams Edible Portion		
	Units		**Proximates**			**Proximates**			**Proximates**		
	kcal		Calories	88		Calories	51		Calories	57	
		Std.	**Minerals**		**Score**	**Minerals**		**Score**	**Minerals**		**Score**
Calcium, Ca	mg	1000	Calcium, Ca	5.00	0.005	Calcium, Ca	8.00	0.008	Calcium, Ca	6.00	0.006
Iron, Fe	mg	13	Iron, Fe	0.33	0.025	Iron, Fe	0.18	0.014	Iron, Fe	0.28	0.022
Magnesium, Mg	mg	370	Magnesium, Mg	4.00	0.011	Magnesium, Mg	5.00	0.014	Magnesium, Mg	6.00	0.016
Phosphorus, P	mg	700	Phosphorus, P	10.00	0.014	Phosphorus, P	11.00	0.016	Phosphorus, P	12.00	0.017
Potassium, K	mg	4700	Potassium, K	40.00	0.009	Potassium, K	54.00	0.011	Potassium, K	77.00	0.016
Sodium, Na	mg	1500	Sodium, Na	3.00	0.002	Sodium, Na	1.00	0.001	Sodium, Na	1.00	0.001
Zinc, Zn	mg	9.5	Zinc, Zn	0.07	0.007	Zinc, Zn	0.07	0.007	Zinc, Zn	0.16	0.017
Copper, Cu	mg	900	Copper, Cu	0.05	0.000	Copper, Cu	0.03	0.000	Copper, Cu	0.06	0.000
Manganese, Mn	mg	2.05	Manganese, Mn	0.20	0.099	Manganese, Mn	0.15	0.072	Manganese, Mn	0.34	0.164
Fluoride, F	µg	3500	Fluoride, F	0.00	0.000	Fluoride, F	0.00	0.000	Fluoride, F	0.00	0.000
Selenium, Se	µg	55	Selenium, Se	0.10	0.002	Selenium, Se	0.10	0.002	Selenium, Se	0.10	0.002
Chromium	µg	30	Chromium	0.00	0.000	Chromium	0.00	0.000	Chromium	0.00	0.000
Iodine	µg	150	Iodine	0.00	0.000	Iodine	0.00	0.000	Iodine	0.00	0.000
Molybdenum	µg	45	Molybdenum	0.00	0.000	Molybdenum	0.00	0.000	Molybdenum	0.00	0.000
Chloride	g	2.3	Chloride	0.00	0.000	Chloride	0.00	0.000	Chloride	0.00	0.000
			Vitamins			**Vitamins**			**Vitamins**		
Vitamin C, total ascorbic acid	mg	82.5	Vitamin C, total ascorbic acid	1.10	0.013	Vitamin C, total ascorbic acid	2.50	0.030	Vitamin C, total ascorbic acid	9.70	0.118
Thiamin	mg	1.15	Thiamin	0.03	0.030	Thiamin	0.03	0.028	Thiamin	0.04	0.032
Riboflavin	mg	1.2	Riboflavin	0.05	0.044	Riboflavin	0.04	0.031	Riboflavin	0.04	0.034
Niacin	mg	15	Niacin	0.11	0.008	Niacin	0.52	0.035	Niacin	0.42	0.028
Pantothenic acid	mg	5	Pantothenic acid	0.09	0.018	Pantothenic acid	0.13	0.025	Pantothenic acid	0.12	0.025
Vitamin B-6	mg	1.3	Vitamin B-6	0.04	0.028	Vitamin B-6	0.06	0.045	Vitamin B-6	0.05	0.040
Folate, total	µg	400	Folate, total	2.00	0.005	Folate, total	7.00	0.018	Folate, total	6.00	0.015
Vitamin B-12	µg	2.4	Vitamin B-12	0.00	0.000	Vitamin B-12	0.00	0.000	Vitamin B-12	0.00	0.000
Vitamin A, RAE	mcg_RAE	800	Vitamin A, RAE	2.00	0.003	Vitamin A, RAE	2.00	0.003	Vitamin A, RAE	3.00	0.004
Vitamin E (alpha-tocopherol)	mg	15	Vitamin E (alpha-tocopherol)	0.38	0.025	Vitamin E (alpha-tocopherol)	0.48	0.032	Vitamin E (alpha-tocopherol)	0.57	0.038
Vitamin D (D2 + D3)	µg	15	Vitamin D (D2 + D3)	0.00	0.000	Vitamin D (D2 + D3)	0.00	0.000	Vitamin D (D2 + D3)	0.00	0.000
Vitamin K (phylloquinone)	µg	110	Vitamin K (phylloquinone)	6.40	0.058	Vitamin K (phylloquinone)	16.40	0.149	Vitamin K (phylloquinone)	19.30	0.175
Choline, total	mg	487.5	Choline, total	4.00	0.008	Choline, total	5.10	0.010	Choline, total	6.00	0.012
Biotin	µg	30	Biotin	0.00	0.000	Biotin	0.00	0.000	Biotin	0.00	0.000
Total Score					**0.005**			**0.011**			**0.014**

	RDA		Cherries, sour, red, canned, heavy syrup pack, solids and liquids			Cherries, sour, red, frozen, unsweetened			Cherries, sour, red, raw		
			Unit 100 Grams Edible Portion			Unit 100 Grams Edible Portion			Unit 100 Grams Edible Portion		
	Units		**Proximates**			**Proximates**			**Proximates**		
	kcal		Calories	88		Calories	51		Calories	57	
		Std.	**Minerals**		**Score**	**Minerals**		**Score**	**Minerals**		**Score**
Calcium, Ca	mg	1000	Calcium, Ca	10.00	0.001	Calcium, Ca	13.00	0.001	Calcium, Ca	16.00	0.000
Iron, Fe	mg	13	Iron, Fe	1.30	0.462	Iron, Fe	0.53	0.692	Iron, Fe	0.32	0.692
Magnesium, Mg	mg	370	Magnesium, Mg	6.00	0.027	Magnesium, Mg	9.00	0.043	Magnesium, Mg	9.00	0.041
Phosphorus, P	mg	700	Phosphorus, P	10.00	0.133	Phosphorus, P	16.00	0.177	Phosphorus, P	15.00	0.247
Potassium, K	mg	4700	Potassium, K	93.00	0.001	Potassium, K	124.00	0.000	Potassium, K	173.00	0.001
Sodium, Na	mg	1500	Sodium, Na	7.00	0.000	Sodium, Na	1.00	0.000	Sodium, Na	3.00	0.000
Zinc, Zn	mg	9.5	Zinc, Zn	0.06	0.007	Zinc, Zn	0.10	0.009	Zinc, Zn	0.10	0.011
Copper, Cu	mg	900	Copper, Cu	0.07	0.000	Copper, Cu	0.09	0.000	Copper, Cu	0.10	0.000
Manganese, Mn	mg	2.05	Manganese, Mn	0.07	0.000	Manganese, Mn	0.06	0.000	Manganese, Mn	0.11	0.000
Fluoride, F	µg	3500	Fluoride, F	0.00	0.000	Fluoride, F	0.00	0.000	Fluoride, F	0.00	0.000
Selenium, Se	µg	55	Selenium, Se	0.00	0.000	Selenium, Se	0.00	0.000	Selenium, Se	0.00	0.000
Chromium	µg	30	Chromium	0.00	0.000	Chromium	0.00	0.000	Chromium	0.00	0.000
Iodine	µg	150	Iodine	0.00	0.000	Iodine	0.00	0.000	Iodine	0.00	0.000
Molybdenum	µg	45	Molybdenum	0.00	0.000	Molybdenum	0.00	0.000	Molybdenum	0.00	0.000
Chloride	g	2.3	Chloride	0.00	0.000	Chloride	0.00	0.000	Chloride	0.00	0.000
			Vitamins			**Vitamins**			**Vitamins**		
Vitamin C, total ascorbic acid	mg	82.5	Vitamin C, total ascorbic acid	2.00	0.000	Vitamin C, total ascorbic acid	1.70	0.001	Vitamin C, total ascorbic acid	10.00	0.000
Thiamin	mg	1.15	Thiamin	0.02	0.034	Thiamin	0.04	0.030	Thiamin	0.03	0.035
Riboflavin	mg	1.2	Riboflavin	0.04	0.140	Riboflavin	0.03	0.114	Riboflavin	0.04	0.333
Niacin	mg	15	Niacin	0.17	0.007	Niacin	0.14	0.012	Niacin	0.40	0.010
Pantothenic acid	mg	5	Pantothenic acid	0.11	0.009	Pantothenic acid	0.18	0.013	Pantothenic acid	0.14	0.009
Vitamin B-6	mg	1.3	Vitamin B-6	0.04	6.154	Vitamin B-6	0.07	3.846	Vitamin B-6	0.04	6.154
Folate, total	µg	400	Folate, total	8.00	0.000	Folate, total	5.00	0.000	Folate, total	8.00	0.000
Vitamin B-12	µg	2.4	Vitamin B-12	0.00	15.000	Vitamin B-12	0.00	18.333	Vitamin B-12	0.00	26.667
Vitamin A, RAE	mcg_RAE	800	Vitamin A, RAE	36.00	0.535	Vitamin A, RAE	44.00	0.653	Vitamin A, RAE	64.00	0.963
Vitamin E (alpha-tocopherol)	mg	15	Vitamin E (alpha-tocopherol)	0.23	0.000	Vitamin E (alpha-tocopherol)	0.05	0.000	Vitamin E (alpha-tocopherol)	0.07	0.000
Vitamin D (D2 + D3)	µg	15	Vitamin D (D2 + D3)	0.00	0.000	Vitamin D (D2 + D3)	0.00	0.000	Vitamin D (D2 + D3)	0.00	0.000
Vitamin K (phylloquinone)	µg	110	Vitamin K (phylloquinone)	1.40	0.000	Vitamin K (phylloquinone)	1.50	0.000	Vitamin K (phylloquinone)	2.10	0.000
Choline, total	mg	487.5	Choline, total	4.10	0.000	Choline, total	5.60	0.000	Choline, total	6.10	0.000
Biotin	µg	30	Biotin	0.00	0.000	Biotin	0.00	0.000	Biotin	0.00	0.000
Total Score					**0.247**			**0.520**			**0.703**

Raspberries

	RDA		Raspberries, canned, red, heavy syrup pack, solids and liquids			Raspberries, frozen, red, sweetened			Raspberries, raw		
			Unit 100 Grams Edible Portion			Unit 100 Grams Edible Portion			Unit 100 Grams Edible Portion		
	Units		**Proximates**			**Proximates**			**Proximates**		
	kcal		Calories	91		Calories	103		Calories	52	
		Std.	**Minerals**		**Score**	**Minerals**		**Score**	**Minerals**		**Score**
Calcium, Ca	mg	1000	Calcium, Ca	11.00	0.011	Calcium, Ca	15.00	0.015	Calcium, Ca	25.00	0.025
Iron, Fe	mg	13	Iron, Fe	0.42	0.032	Iron, Fe	0.65	0.050	Iron, Fe	0.69	0.053
Magnesium, Mg	mg	370	Magnesium, Mg	12.00	0.032	Magnesium, Mg	13.00	0.035	Magnesium, Mg	22.00	0.059
Phosphorus, P	mg	700	Phosphorus, P	9.00	0.013	Phosphorus, P	17.00	0.024	Phosphorus, P	29.00	0.041
Potassium, K	mg	4700	Potassium, K	94.00	0.020	Potassium, K	114.00	0.024	Potassium, K	151.00	0.032
Sodium, Na	mg	1500	Sodium, Na	3.00	0.002	Sodium, Na	1.00	0.001	Sodium, Na	1.00	0.001
Zinc, Zn	mg	9.5	Zinc, Zn	0.16	0.017	Zinc, Zn	0.18	0.019	Zinc, Zn	0.42	0.044
Copper, Cu	mg	900	Copper, Cu	0.06	0.000	Copper, Cu	0.11	0.000	Copper, Cu	0.09	0.000
Manganese, Mn	mg	2.05	Manganese, Mn	0.23	0.114	Manganese, Mn	0.65	0.317	Manganese, Mn	0.67	0.327
Fluoride, F	µg	3500	Fluoride, F	0.00	0.000	Fluoride, F	0.00	0.000	Fluoride, F	0.00	0.000
Selenium, Se	µg	55	Selenium, Se	0.10	0.002	Selenium, Se	0.30	0.005	Selenium, Se	0.20	0.004
Chromium	µg	30	Chromium	0.00	0.000	Chromium	0.00	0.000	Chromium	0.00	0.000
Iodine	µg	150	Iodine	0.00	0.000	Iodine	0.00	0.000	Iodine	0.00	0.000
Molybdenum	µg	45	Molybdenum	0.00	0.000	Molybdenum	0.00	0.000	Molybdenum	0.00	0.000
Chloride	g	2.3	Chloride	0.00	0.000	Chloride	0.00	0.000	Chloride	0.00	0.000
			Vitamins			**Vitamins**			**Vitamins**		
Vitamin C, total ascorbic acid	mg	82.5	Vitamin C, total ascorbic acid	8.70	0.105	Vitamin C, total ascorbic acid	16.50	0.200	Vitamin C, total ascorbic acid	26.20	0.318
Thiamin	mg	1.15	Thiamin	0.02	0.017	Thiamin	0.02	0.017	Thiamin	0.03	0.028
Riboflavin	mg	1.2	Riboflavin	0.03	0.026	Riboflavin	0.05	0.038	Riboflavin	0.04	0.032
Niacin	mg	15	Niacin	0.44	0.030	Niacin	0.23	0.015	Niacin	0.60	0.040
Pantothenic acid	mg	5	Pantothenic acid	0.25	0.049	Pantothenic acid	0.15	0.030	Pantothenic acid	0.33	0.066
Vitamin B-6	mg	1.3	Vitamin B-6	0.04	0.032	Vitamin B-6	0.03	0.026	Vitamin B-6	0.06	0.042
Folate, total	µg	400	Folate, total	11.00	0.028	Folate, total	26.00	0.065	Folate, total	21.00	0.053
Vitamin B-12	µg	2.4	Vitamin B-12	0.00	0.000	Vitamin B-12	0.00	0.000	Vitamin B-12	0.00	0.000
Vitamin A, RAE	mcg_RAE	800	Vitamin A, RAE	2.00	0.003	Vitamin A, RAE	3.00	0.004	Vitamin A, RAE	2.00	0.003
Vitamin E (alpha-tocopherol)	mg	15	Vitamin E (alpha-tocopherol)	0.59	0.039	Vitamin E (alpha-tocopherol)	0.72	0.048	Vitamin E (alpha-tocopherol)	0.87	0.058
Vitamin D (D2 + D3)	µg	15	Vitamin D (D2 + D3)	0.00	0.000	Vitamin D (D2 + D3)	0.00	0.000	Vitamin D (D2 + D3)	0.00	0.000
Vitamin K (phylloquinone)	µg	110	Vitamin K (phylloquinone)	5.20	0.047	Vitamin K (phylloquinone)	6.50	0.059	Vitamin K (phylloquinone)	7.80	0.071
Choline, total	mg	487.5	Choline, total	8.20	0.017	Choline, total	10.20	0.021	Choline, total	12.30	0.025
Biotin	µg	30	Biotin	0.00	0.000	Biotin	0.00	0.000	Biotin	0.00	0.000
Total Score					**0.007**			**0.010**			**0.025**

Pinapples

	RDA		Pineapple, canned, juice pack, solids and liquids				Pineapple, raw, traditional varieties		
			Unit 100 Grams Edible Portion				Unit 100 Grams Edible Portion		
	Units		**Proximates**				**Proximates**		
	kcal		Calories	60			Calories	45	
		Std.	**Minerals**		**Score**		**Minerals**		**Score**
Calcium, Ca	mg	1000	Calcium, Ca	14.00	0.014		Calcium, Ca	13.00	0.013
Iron, Fe	mg	13	Iron, Fe	0.28	0.022		Iron, Fe	0.25	0.019
Magnesium, Mg	mg	370	Magnesium, Mg	14.00	0.038		Magnesium, Mg	12.00	0.032
Phosphorus, P	mg	700	Phosphorus, P	6.00	0.009		Phosphorus, P	9.00	0.013
Potassium, K	mg	4700	Potassium, K	122.00	0.026		Potassium, K	125.00	0.027
Sodium, Na	mg	1500	Sodium, Na	1.00	0.001		Sodium, Na	1.00	0.001
Zinc, Zn	mg	9.5	Zinc, Zn	0.10	0.011		Zinc, Zn	0.08	0.008
Copper, Cu	mg	900	Copper, Cu	0.09	0.000		Copper, Cu	0.08	0.000
Manganese, Mn	mg	2.05	Manganese, Mn	1.12	0.547		Manganese, Mn	1.59	0.777
Fluoride, F	µg	3500	Fluoride, F	4.20	0.001		Fluoride, F	0.00	0.000
Selenium, Se	µg	55	Selenium, Se	0.40	0.007		Selenium, Se	0.00	0.000
Chromium	µg	30	Chromium	0.00	0.000		Chromium	0.00	0.000
Iodine	µg	150	Iodine	0.00	0.000		Iodine	0.00	0.000
Molybdenum	µg	45	Molybdenum	0.00	0.000		Molybdenum	0.00	0.000
Chloride	g	2.3	Chloride	0.00	0.000		Chloride	0.00	0.000
			Vitamins				**Vitamins**		
Vitamin C, total ascorbic acid	mg	82.5	Vitamin C, total ascorbic acid	9.50	0.115		Vitamin C, total ascorbic acid	16.90	0.205
Thiamin	mg	1.15	Thiamin	0.10	0.083		Thiamin	0.08	0.068
Riboflavin	mg	1.2	Riboflavin	0.02	0.016		Riboflavin	0.03	0.024
Niacin	mg	15	Niacin	0.28	0.019		Niacin	0.47	0.031
Pantothenic acid	mg	5	Pantothenic acid	0.10	0.020		Pantothenic acid	0.19	0.039
Vitamin B-6	mg	1.3	Vitamin B-6	0.07	0.057		Vitamin B-6	0.11	0.082
Folate, total	µg	400	Folate, total	5.00	0.013		Folate, total	11.00	0.028
Vitamin B-12	µg	2.4	Vitamin B-12	0.00	0.000		Vitamin B-12	0.00	0.000
Vitamin A, RAE	mcg_RAE	800	Vitamin A, RAE	2.00	0.003		Vitamin A, RAE	3.00	0.004
Vitamin E (alpha-tocopherol)	mg	15	Vitamin E (alpha-tocopherol)	0.01	0.001		Vitamin E (alpha-tocopherol)	0.00	0.000
Vitamin D (D2 + D3)	µg	15	Vitamin D (D2 + D3)	0.00	0.000		Vitamin D (D2 + D3)	0.00	0.000
Vitamin K (phylloquinone)	µg	110	Vitamin K (phylloquinone)	0.30	0.003		Vitamin K (phylloquinone)	0.70	0.006
Choline, total	mg	487.5	Choline, total	4.80	0.010		Choline, total	5.60	0.011
Biotin	µg	30	Biotin	0.00	0.000		Biotin	0.00	0.000
Total Score					**0.017**				**0.031**

	RDA		Apricots, canned, heavy syrup pack, with skin, solids and liquids					Apricots, raw		
			Unit 100 Grams Edible Portion					Unit 100 Grams Edible Portion		
	Units		**Proximates**					**Proximates**		
	kcal		Calories	83				Calories	48	
		Std.	**Minerals**		**Score**			**Minerals**		**Score**
Calcium, Ca	mg	1000	Calcium, Ca	9.00	0.009			Calcium, Ca	13.00	0.013
Iron, Fe	mg	13	Iron, Fe	0.30	0.023			Iron, Fe	0.39	0.030
Magnesium, Mg	mg	370	Magnesium, Mg	7.00	0.019			Magnesium, Mg	10.00	0.027
Phosphorus, P	mg	700	Phosphorus, P	12.00	0.017			Phosphorus, P	23.00	0.033
Potassium, K	mg	4700	Potassium, K	140.00	0.030			Potassium, K	259.00	0.055
Sodium, Na	mg	1500	Sodium, Na	4.00	0.003			Sodium, Na	1.00	0.001
Zinc, Zn	mg	9.5	Zinc, Zn	0.11	0.012			Zinc, Zn	0.20	0.021
Copper, Cu	mg	900	Copper, Cu	0.08	0.000			Copper, Cu	0.08	0.000
Manganese, Mn	mg	2.05	Manganese, Mn	0.05	0.025			Manganese, Mn	0.08	0.038
Fluoride, F	µg	3500	Fluoride, F	4.20	0.001			Fluoride, F	0.00	0.000
Selenium, Se	µg	55	Selenium, Se	0.10	0.002			Selenium, Se	0.10	0.002
Chromium	µg	30	Chromium	0.00	0.000			Chromium	0.00	0.000
Iodine	µg	150	Iodine	0.00	0.000			Iodine	0.00	0.000
Molybdenum	µg	45	Molybdenum	0.00	0.000			Molybdenum	0.00	0.000
Chloride	g	2.3	Chloride	0.00	0.000			Chloride	0.00	0.000
			Vitamins					**Vitamins**		
Vitamin C, total ascorbic acid	mg	82.5	Vitamin C, total ascorbic acid	3.10	0.038			Vitamin C, total ascorbic acid	10.00	0.121
Thiamin	mg	1.15	Thiamin	0.02	0.017			Thiamin	0.03	0.026
Riboflavin	mg	1.2	Riboflavin	0.02	0.018			Riboflavin	0.04	0.033
Niacin	mg	15	Niacin	0.38	0.025			Niacin	0.60	0.040
Pantothenic acid	mg	5	Pantothenic acid	0.09	0.018			Pantothenic acid	0.24	0.048
Vitamin B-6	mg	1.3	Vitamin B-6	0.05	0.042			Vitamin B-6	0.05	0.042
Folate, total	µg	400	Folate, total	2.00	0.005			Folate, total	9.00	0.023
Vitamin B-12	µg	2.4	Vitamin B-12	0.00	0.000			Vitamin B-12	0.00	0.000
Vitamin A, RAE	mcg_RAE	800	Vitamin A, RAE	62.00	0.078			Vitamin A, RAE	96.00	0.120
Vitamin E (alpha-tocopherol)	mg	15	Vitamin E (alpha-tocopherol)	0.60	0.040			Vitamin E (alpha-tocopherol)	0.89	0.059
Vitamin D (D2 + D3)	µg	15	Vitamin D (D2 + D3)	0.00	0.000			Vitamin D (D2 + D3)	0.00	0.000
Vitamin K (phylloquinone)	µg	110	Vitamin K (phylloquinone)	2.20	0.020			Vitamin K (phylloquinone)	3.30	0.030
Choline, total	mg	487.5	Choline, total	1.80	0.004			Choline, total	2.80	0.006
Biotin	µg	30	Biotin	0.00	0.000			Biotin	0.00	0.000
Total Score					**0.005**					**0.016**

Blackberries

	RDA		Blackberries, canned, heavy syrup, solids and liquids			Blackberries, frozen, unsweetened			Blackberries, raw		
			Unit 100 Grams Edible Portion			Unit 100 Grams Edible Portion			Unit 100 Grams Edible Portion		
	Units		**Proximates**			**Proximates**			**Proximates**		
	kcal		Calories	92		Calories	64		Calories	43	
		Std.	**Minerals**		**Score**	**Minerals**		**Score**	**Minerals**		**Score**
Calcium, Ca	mg	1000	Calcium, Ca	21.00	0.021	Calcium, Ca	29.00	0.029	Calcium, Ca	29.00	0.029
Iron, Fe	mg	13	Iron, Fe	0.65	0.050	Iron, Fe	0.80	0.062	Iron, Fe	0.62	0.048
Magnesium, Mg	mg	370	Magnesium, Mg	17.00	0.046	Magnesium, Mg	22.00	0.059	Magnesium, Mg	20.00	0.054
Phosphorus, P	mg	700	Phosphorus, P	14.00	0.020	Phosphorus, P	30.00	0.043	Phosphorus, P	22.00	0.031
Potassium, K	mg	4700	Potassium, K	99.00	0.021	Potassium, K	140.00	0.030	Potassium, K	162.00	0.034
Sodium, Na	mg	1500	Sodium, Na	3.00	0.002	Sodium, Na	1.00	0.001	Sodium, Na	1.00	0.001
Zinc, Zn	mg	9.5	Zinc, Zn	0.18	0.019	Zinc, Zn	0.25	0.026	Zinc, Zn	0.53	0.056
Copper, Cu	mg	900	Copper, Cu	0.13	0.000	Copper, Cu	0.12	0.000	Copper, Cu	0.17	0.000
Manganese, Mn	mg	2.05	Manganese, Mn	0.70	0.340	Manganese, Mn	1.22	0.597	Manganese, Mn	0.65	0.315
Fluoride, F	µg	3500	Fluoride, F	4.20	0.001	Fluoride, F	0.00	0.000	Fluoride, F	0.00	0.000
Selenium, Se	µg	55	Selenium, Se	0.30	0.005	Selenium, Se	0.40	0.007	Selenium, Se	0.40	0.007
Chromium	µg	30	Chromium	0.00	0.000	Chromium	0.00	0.000	Chromium	0.00	0.000
Iodine	µg	150	Iodine	0.00	0.000	Iodine	0.00	0.000	Iodine	0.00	0.000
Molybdenum	µg	45	Molybdenum	0.00	0.000	Molybdenum	0.00	0.000	Molybdenum	0.00	0.000
Chloride	g	2.3	Chloride	0.00	0.000	Chloride	0.00	0.000	Chloride	0.00	0.000
			Vitamins			**Vitamins**			**Vitamins**		
Vitamin C, total ascorbic acid	mg	82.5	Vitamin C, total ascorbic acid	2.80	0.034	Vitamin C, total ascorbic acid	3.10	0.038	Vitamin C, total ascorbic acid	21.00	0.255
Thiamin	mg	1.15	Thiamin	0.03	0.023	Thiamin	0.03	0.025	Thiamin	0.02	0.017
Riboflavin	mg	1.2	Riboflavin	0.04	0.033	Riboflavin	0.05	0.038	Riboflavin	0.03	0.022
Niacin	mg	15	Niacin	0.29	0.019	Niacin	1.21	0.080	Niacin	0.65	0.043
Pantothenic acid	mg	5	Pantothenic acid	0.15	0.030	Pantothenic acid	0.15	0.030	Pantothenic acid	0.28	0.055
Vitamin B-6	mg	1.3	Vitamin B-6	0.04	0.028	Vitamin B-6	0.06	0.047	Vitamin B-6	0.03	0.023
Folate, total	µg	400	Folate, total	27.00	0.068	Folate, total	34.00	0.085	Folate, total	25.00	0.063
Vitamin B-12	µg	2.4	Vitamin B-12	0.00	0.000	Vitamin B-12	0.00	0.000	Vitamin B-12	0.00	0.000
Vitamin A, RAE	mcg_RAE	800	Vitamin A, RAE	11.00	0.014	Vitamin A, RAE	6.00	0.008	Vitamin A, RAE	11.00	0.014
Vitamin E (alpha-tocopherol)	mg	15	Vitamin E (alpha-tocopherol)	0.78	0.052	Vitamin E (alpha-tocopherol)	1.17	0.078	Vitamin E (alpha-tocopherol)	1.17	0.078
Vitamin D (D2 + D3)	µg	15	Vitamin D (D2 + D3)	0.00	0.000	Vitamin D (D2 + D3)	0.00	0.000	Vitamin D (D2 + D3)	0.00	0.000
Vitamin K (phylloquinone)	µg	110	Vitamin K (phylloquinone)	13.30	0.121	Vitamin K (phylloquinone)	19.80	0.180	Vitamin K (phylloquinone)	19.80	0.180
Choline, total	mg	487.5	Choline, total	5.70	0.012	Choline, total	8.50	0.017	Choline, total	8.50	0.017
Biotin	µg	30	Biotin	0.00	0.000	Biotin	0.00	0.000	Biotin	0.00	0.000
Total Score					**0.010**			**0.023**			**0.031**

Pears

	RDA		Pears, canned, juice pack, solids and liquids				Pears, raw		
			Unit 100 Grams Edible Portion				Unit 100 Grams Edible Portion		
	Units		**Proximates**				**Proximates**		
	kcal		Calories	50			Calories	58	
		Std.	**Minerals**		**Score**		**Minerals**		**Score**
Calcium, Ca	mg	1000	Calcium, Ca	9.00	0.000		Calcium, Ca	9.00	0.000
Iron, Fe	mg	13	Iron, Fe	0.29	0.538		Iron, Fe	0.17	0.538
Magnesium, Mg	mg	370	Magnesium, Mg	7.00	0.032		Magnesium, Mg	7.00	0.030
Phosphorus, P	mg	700	Phosphorus, P	12.00	0.137		Phosphorus, P	11.00	0.170
Potassium, K	mg	4700	Potassium, K	96.00	0.001		Potassium, K	119.00	0.000
Sodium, Na	mg	1500	Sodium, Na	4.00	0.000		Sodium, Na	1.00	0.000
Zinc, Zn	mg	9.5	Zinc, Zn	0.09	0.006		Zinc, Zn	0.10	0.009
Copper, Cu	mg	900	Copper, Cu	0.05	0.000		Copper, Cu	0.08	0.000
Manganese, Mn	mg	2.05	Manganese, Mn	0.03	0.000		Manganese, Mn	0.05	1.073
Fluoride, F	µg	3500	Fluoride, F	0.00	0.000		Fluoride, F	2.20	0.000
Selenium, Se	µg	55	Selenium, Se	0.00	0.000		Selenium, Se	0.10	0.002
Chromium	µg	30	Chromium	0.00	0.000		Chromium	0.00	0.000
Iodine	µg	150	Iodine	0.00	0.000		Iodine	0.00	0.000
Molybdenum	µg	45	Molybdenum	0.00	0.000		Molybdenum	0.00	0.000
Chloride	g	2.3	Chloride	0.00	0.000		Chloride	0.00	0.000
			Vitamins				**Vitamins**		
Vitamin C, total ascorbic acid	mg	82.5	Vitamin C, total ascorbic acid	1.60	0.019		Vitamin C, total ascorbic acid	4.20	0.051
Thiamin	mg	1.15	Thiamin	0.01	0.010		Thiamin	0.01	0.010
Riboflavin	mg	1.2	Riboflavin	0.01	0.009		Riboflavin	0.03	0.021
Niacin	mg	15	Niacin	0.20	0.013		Niacin	0.16	0.010
Pantothenic acid	mg	5	Pantothenic acid	0.02	0.004		Pantothenic acid	0.05	0.010
Vitamin B-6	mg	1.3	Vitamin B-6	0.01	0.011		Vitamin B-6	0.03	0.022
Folate, total	µg	400	Folate, total	1.00	0.003		Folate, total	7.00	0.018
Vitamin B-12	µg	2.4	Vitamin B-12	0.00	0.000		Vitamin B-12	0.00	0.000
Vitamin A, RAE	mcg_RAE	800	Vitamin A, RAE	0.00	0.000		Vitamin A, RAE	1.00	0.001
Vitamin E (alpha-tocopherol)	mg	15	Vitamin E (alpha-tocopherol)	0.08	0.005		Vitamin E (alpha-tocopherol)	0.12	0.008
Vitamin D (D2 + D3)	µg	15	Vitamin D (D2 + D3)	0.00	0.000		Vitamin D (D2 + D3)	0.00	0.000
Vitamin K (phylloquinone)	µg	110	Vitamin K (phylloquinone)	0.30	0.003		Vitamin K (phylloquinone)	4.50	0.041
Choline, total	mg	487.5	Choline, total	3.40	0.007		Choline, total	5.10	0.010
Biotin	µg	30	Biotin	0.00	0.000		Biotin	0.00	0.000
Total Score					**0.016**				**0.035**