

# FALL INTO NUTRITION

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## Berries are Berry Berry Good For You By Sheila M. Barry, M3

Berries are a summer staple with far-reaching nutritional benefits. Not only do they taste great, they are also packed with vitamins, minerals, and fiber. Interestingly, their strongest biological impact comes from containing different phytochemicals, chemical compounds derived from plants. This article will detail the nutritional content of berries, and introduce some of the potential health benefits.

For a long time, berries have been known as excellent

sources of vitamins and minerals. The nutritional content of several popular berries are summarized in Table 1. Strawberries provide over a full day's amount of vitamin C in just one cup. Vitamin C is shown to support the immune system and strengthen connective tissue. Blueberries contain a smaller amount of vitamin C, but also contain 28mcg of vitamin K and nearly 4 g of soluble and insoluble fiber. This is significant because vitamin K is involved in the



production of clotting factors, thereby assisting in control of bleeding. Insoluble fiber helps with gastric motility, while soluble fiber has been shown to lower LDL cholesterol levels.

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## The Skinny on Diet Soda—A Big Fat Lie? By: Dmitri Shuster, M3

Prior to 1952, if you wanted to sweeten your coffee, tea, or dessert, you had to do it the old fashion way—with sugar! Yes, that *evil* white sand that so many Americans now

dread and fear was at one time void of the stigma that it currently carries in society. Today, with the epidemic rates of childhood obesity, early onset diabetes and the sequelae that

follows; natural caloric sweeteners, like granulated sugar and honey, take on a lot of the blame. There is certainly truth behind America's ever-growing daily See Page 3

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### Special points of interest:

- Which berry is best for your health?
- To diet soda or not to diet soda, that is the question!
- What type of milk is best for toddlers?
- Fill up on fiber, but which one?
- Curry, mustard and turmeric, what is the link?

## BERRIES...CONTINUED

Table 1. Nutritional content of popular berries

Fruit	Serving Size	Calories	Carbo-hydrates	Vitamin C	Vitamin E	Vitamin K	Fiber
<b>Blackberries</b>	1 cup (144g)	62	5% (15g)	50% (30.2mg)	8% (1.7mg)	36% (28.5mcg)	31% (7.6g)
<b>Blueberries</b>	1 cup (148g)	84	7% (21g)	24% (14.4mg)	4% (0.8mg)	36% (28.6mcg)	14% (3.6g)
<b>Cranberries</b>	1 cup (110g)	51	4% (13g)	24% (14mg)	7% (1.3mg)	7% (5mcg)	20% (5.1g)
<b>Raspberries</b>	1 cup (123g)	64	5% (15g)	54% (32.2mg)	5% (1.1mg)	12% (9.6mcg)	32% (8.0g)
<b>Strawberries</b>	1 cup (144g)	62	5% (15g)	50% (30.2mg)	8% (1.7mg)	36% (28.5mcg)	31% (7.6g)

Percentages shown are USDA daily values based on 2,000 calorie diet. Information obtained from USDA and [www.nutritiondata.com](http://www.nutritiondata.com).

In recent years, berries have increased in popularity as studies have recognized their protective qualities. In general, berries have been suggested to protect against various forms of cancer and promote cardiovascular health, through antioxidant-mediated endothelial protection. Cranberries increase circulating HDL cholesterol, and separately reduce expression inflammatory and adhesive proteins. Increased cranberry consumption has been shown to decrease the incidence of symptomatic urinary tract infections (UTIs), especially in women with recurrent UTIs. Blueberries also have a similar ability. Interestingly, strawberries and blueberries have both been implicated as neuroprotective and may reduce the effect of Alzheimer's disease or progressive dementia. In fact, consumption of strawberries or blueberries reversed age-related cognitive deficits and improved motor performance in murine studies.

It is thought these effects are due to a variety of phytochemicals. Proanthocyanidins and tannins, found in cranberries and blueberries, have demonstrated anti-adhesive properties, preventing bacteria from binding to tissue surfaces. Ellagic acid, another phenolic compound, is found at high levels in blueberries and strawberries and research suggests it may reduce the risk of developing several cancer types including colon, esophageal, liver, lung, and skin cancers. Anthocyanin is the phytochemical responsible for giving berries their dark red, blue, and purple colors. In addition to providing color, anthocyanins improve the cardiovascular system and inhibit the growth of cancer cells *in vitro*. Anthocyanins have also been shown to cross into the brain, where their levels correlate with improved cognitive performance. Current research is focused on isolating phytochemicals from berries and determining their individual activities thereby elucidating the mechanism of protection. While most research has concentrated on strawberries, cranberries and blueberries, it is likely all forms of berries have phytochemicals with properties beneficial toward health maintenance.

Berry seasons are typically in the spring and summer, with the exception of cranberries whose harvest time is in the fall. However, fresh berries can still be obtained in winter months, as countries from the Southern Hemisphere (e.g. Chile) export their harvest to frigid northern cities. And even if fresh berries can't be found, frozen berries hold the same nutritional content, phytochemicals and health benefits. So the benefits of berries can be enjoyed year round.

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## SKINNY ON DIET SODA...CONTINUED

caloric intake from natural sweeteners. Some of the most calorie rich foods that children consume are sweets in the form of drinks and desserts. The current mainstream solution to this problem is to decrease the total number of calories that children consume by substituting artificial, calorie free sweeteners, for the natural calorie rich sweeteners. Unfortunately, several recent research articles suggest that such a solution may actually be contributing to the problem!

While the methods and results of the studies were vastly different, the general theme was unanimous: “Changing the food energy intake from one food will not necessarily change a person's overall food energy intake, or cause a person to lose weight.” Several studies actually suggested the opposite, where consumption of diet soda correlated with increased weight gain. Additionally, a study by researchers with the Framingham Heart Study suggested that consumption of diet soda correlated to increases in metabolic syndrome.

In order to explain these seemingly counter-intuitive results, one study utilized a Pavlovian analysis for understanding the control of food intake and body weight. The concept is remarkably simple. “Animals use sweet taste to predict the caloric contents of food. Eating sweet noncaloric substances may degrade this predictive relationship, leading to positive energy balance through increased food intake.”<sup>3</sup> To clarify, when we taste food, it is thought that the cephalic-phase reflexes anticipate and prepare for the arrival of nutrients in the gastrointestinal tract, increasing the efficiency of nutrient

utilization and “minimizing the degree to which those nutrients perturb homeostasis by producing positive energy balance”, also known as weight gain.

The researchers wanted to identify if altering this predictive cephalic-phase response altered weight gain, body composition, and compensatory calorie cravings. To test this, they had two groups of rats and two different diet plans. In both diet groups the rats had access to calorie rich dry food that the rats could eat at will. However, one group that was fed yogurt sweetened with natural sweetener (20% glucose), and another group that was fed artificially sweetened (0.3% saccharine) yogurt. After 5 weeks, the researchers analyzed the body composition of the two groups of rats and identified that rats on *artificial* sweeteners had significantly greater adiposity, greater body weight gain, and greater caloric intake than the other group. Due to a loss of the predictive relationship of sweet tasting food and calorie intake, the rats eating the low/no calorie artificially sweetened yogurt compensated by eating much more dry food.

Additionally, the metabolism rate of the rats eating the artificial sweetener diet was significantly slower. This was measured by testing the increases in core body temperature that animals exhibit after a meal. The increase in energy is associated with energy utilization—a measure of one’s metabolism. The rats that ate the artificially sweetened yogurt did not have an increase in core body temperature, and thus did not utilize energy as efficiently as the rats eating the naturally sweetened yogurt.

While it is irresistibly tempting,

one must remember that in reading research articles like this, one must be very careful not to jump to false conclusions. The authors of the aforementioned study recognize that they are unclear of the physiologic mechanisms responsible for the results of their data. Additionally, if we dare believe that the research results on these rats are valid and can be extrapolated to humans, we would still have numerous unanswered questions. If diet soda can be correlated to weight gain, is the obesity and diabetes epidemic in America a cause or effect of artificial sweeteners. In other words, are overweight patients drinking diet soda because they are obese or are they obese because they are drinking diet soda? The answer to this question make take decades to develop, in the mean time, Americans would be wise to stick to the proven ways of staying healthy—exercising, eating healthy, and refraining from tobacco.



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## Long Live Olives! By: Jermaine Bridges, M3

Staying true to its nature, the subject of olives tends to elicit a very strong response by most people. Some might yell, "I absolutely love olives!" On the contrary, one might hear people say, "I only eat olives when I'm drinking. Otherwise, I can't stand olives!" The closest these people come to consuming olives on a daily basis is when they put olive oil on the frying pan before cooking their favorite dish. And then there are those people, myself included, who fall into a third category. These people are innate olive-haters but learn to "endure" olives because of their alleged health benefits. So what is the deal with olives? Are they really that good for you? And if so, what about olives makes them healthy?

Epidemiological studies conducted in the latter twentieth century have demonstrated that people of Mediterranean populations consume a higher amount of olives/olive oil and reap the benefits of having lower incidences of major illnesses such as cancer and cardiovascular disease [1]. Much of their "good health" is attributed to the so-called 'Mediterranean diet' which is comprised of "abundant plant foods, fresh fruit as the typical daily dessert, olive oil as the principal source of fat, dairy products (principally cheese and yogurt), and fish and poultry consumed in low to moderate amounts, zero to four eggs consumed weekly, red meat consumed in low amounts, and wine consumed in low to moderate amounts" [4]. Although a lot of research has been done on the antioxidant properties of olives, it is only in the recent past where the research has focused on the exact composition of olives/olive oil in an effort to elucidate its beneficial effects.



The main health benefits of olives and olive oils come from their high concentrations of phenolic antioxidants and squalene. "Phenol" refers to any compound that contains a six-membered ring, bonded directly to a hydroxyl group (-OH). Historically, it has served many purposes. Phenol was once used as an antiseptic during surgical procedures, it was the main ingredient of "Carbolic Smoke Ball" to protect against influenza and other ailments, it was used in the "Battle Creek Sanitarium" to discourage female masturbation by applying it to the clitoris, and it is used to manufacture aspirin, herbicides, and synthetic resins. Execution by phenol injection was the mechanism used by Nazis in their euthanasia program to execute smaller groups of people. Sunscreens contain phenol due to the UV-absorbing qualities of the aromatic ring within the phenol. In olives, phenols are beneficial for their free radical scavenging properties. Phenolic compounds are a class of antioxidant agents which act as free radical terminators, thus explaining its anti-cancer properties. [1,3,5]

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## LONG LIVE OLIVES...CONTINUED

Squalene is another component of olive oil known for its anti-cancer properties. It is a natural organic compound produced from shark liver oil and certain plant sources. All higher organisms, including humans, produce squalene, as it is a biochemical precursor to steroids. Experiments on animal models have shown squalene to inhibit beta-hydroxy-beta-methylglutaryl-CoA reductase. This, in turn, leads to a reduction in the amount of available farnesyl pyrophosphate, which is a compound needed for prenylation (addition of hydrophobic molecules to protein). One such protein that undergoes prenylation is the ras oncogene, which plays a key role in the development of cancer. In short, squalene inhibits the activation of the ras oncogene, ultimately inhibiting tumor growth.

In summary, the beneficial effects of olives and olive oil are due to their high concentrations of phenol and squalene. Studies have shown that people consuming a 'Mediterranean diet' enjoy a healthier lifestyle relative to the rest of the world. One must be cautious of the term

"healthy lifestyle" for it is ill-defined in these papers; measurements of people's blood pressures, lipid profiles, etc. were not conducted or omitted. However, there is clear evidence of a lower incidence of major illnesses such as cardiovascular disease and cancer in these populations, and experts believe much of that may be attributed to their high consumption of olives and olive oils. So the next time you're at Subway, remember to say, "olives please."

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## Turmeric or Tumor-gone? By: Neha Goel, M3

Turmeric is best known in the US for making mustard yellow, and abroad for serving as the key ingredient for making curry. However, despite its uses as flavoring and color, turmeric proves to be a powerful spice when it comes to its health benefits. Originating from the *Curcuma longa* plant, turmeric has been used for millennia in India and China as a powerful anti-inflammatory medication used to treat a variety of conditions such as menstrual difficulties, hemorrhage, toothaches, bruises.

Specifically, the yellow pigment of turmeric known as Curcumin is believed to be the pharmacological agent. A number of studies have shown turmeric to be as potent as anti-inflammatory medications such as hydrocortisone, phenylbutazone, and Motrin, without the negative side effects of ulcer formation or decreased WBCs.

### So what diseases is turmeric used to treat?

According to recent research, turmeric is an effective treatment for inflammatory bowel disease (IBD) such as Crohn's and Ulcerative Colitis. In this study, the mice that were given curcumin five days prior to receiving an inflammatory agent that induces colitis were protected and ended up losing less weight, had decreased mucosal ulceration, decreased intestinal wall thickening, and a decreased number of inflammatory cells! These protective benefits are believed to be due to inhibition of NF kappa-B, a major inflammatory agent.

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## The extreme cost of the red bull wings By: Kathya Valdez, M3

Red Bull and other energy drinks are multimillion businesses that have increased in popularity since the nineties when they were first introduced. One cannot hide very well from the red bull commercials that show the "wonderful" little wings that lift the user away saving them from their problems or the shiny cans on grocery store aisles. What exactly is found in these magical cans? The official Redbull website reports the ingredients of sucrose, glucose, taurine, glucuronolactone, niacin, B6, pantothenic acid, B12 and caffeine. A new sugar-free version was also introduced in 2003 which replaces sucrose and glucose with aspartame and acesulfame potassium. The amount of caffeine is 80 mg which is close to the average 72 mg in 6 ounces of coffee or the 80 mg in 2 cans of coke. Red Bull contains one of the least amounts of caffeine among energy drinks which contain up to 300mg of caffeine per can. Other energy drinks are known to

contain guarana, and ginseng. The latest research has shown that the amount of active ingredients in Red Bull and other energy drinks, other than caffeine and sugar, are too low in quantity to cause any adverse events or

therapeutic benefits. However the high levels of caffeine and sugar can lead to adverse health effects, especially when multiple cans are taken per day on a regular basis. The negative effects have been known to include insomnia, nervousness, headache, and tachycardia. There have also been four separate



cases of seizures associated with extreme consumption of energy drinks. A new case of adverse reactions to Red Bull was reported in Italy this past June. A professional 16 year old volleyball player experienced an increase of 40 beats per minute without any change in blood pressure any time she stood up

which led to episodes of transient loss of consciousness. The episodes became so frequent that she had to discontinue her volleyball career. The patient was not aware of the high levels of caffeine and other ingredients in the energy drink and was using it 4-5 times a day because she enjoyed the taste. One week after stopping the use of Red Bull the patient was asymptomatic and was able to resume her normal activities.

One newer use of energy drinks that become very popular is mixing them with alcohol, especially on college campuses. A study of over 4,000 college students from 10 different universities was published this year by Wake Forest. It reported that close to 25% of the students in a study of over 4,000 college students from 10 different universities mixed alcohol with energy drinks. This group of students was also more likely to be involved in risky behaviors such as: being taking advantage of sexually, taking advantage of another sexually, riding with an intoxicated driver, being physically hurt, or requiring medical treatment compared to other students who drank the same amount of alcohol without energy drinks. See Page 8

## Turmeric or Tumor-gone? Continued...

Curcumin's anti-oxidant properties have also shown promising results when it comes to reducing joint inflammation in rheumatoid arthritis by neutralizing free radicals. According a recent study of rheumatoid arthritis patients, treatment with curcumin provided similar results to using phenylbutazone in that patients had decreased morning stiffness.

A recent study in *Science* also revealed that curcumin can correct the DeltaF508 mutation which results in the production of a misfolded CFTR protein, leading to cystic fibrosis. In normal cells, the CFTR protein travels to the cell surface and serves as a channel for chloride to leave the cell. However, if the protein is misshaped, chloride builds up and leads to mucus production.

If everything else hasn't convinced you of this miracle spice...it has also been shown to prevent cancer! Research has shown that curcumin's antioxidant properties allow it to protect colon cells from free radical damage, an important benefit since colon cells have a high turn over rate, which leaves room for mutations, and in turn cancer. It has also been shown to reduce the number and size of precancerous lesions.

Epidemiological studies have also linked the frequent use of turmeric to lower rates of breast, prostate, lung and colon cancer. Research conducted at the University of Texas revealed that curcumin also slows metastases of breast cancer cells into the lungs of mice.

In this study, published in *Biochemical Pharmacology*, September 2005, human breast cancer cells were injected into mice, and the resulting tumors removed to simulate a mastectomy. The mice were then divided into four groups, each of which was treated with 1) nothing—the control group, 2) paclitaxel, 3) curcumin, and 4) both paclitaxel and curcumin. After 5 weeks, 50% of the mice in the curcumin-only group and 22% of those in the curcumin and paclitaxel group showed metastases to the lungs. However, 75% of the mice that got Taxol alone and 95% of the control group developed lung tumors. Another research study conducted in China showed that curcumin improves lung function post-bleomycin treatment.

Curcumin has also been proven to decrease rates of Alzheimer's and its progression. Epidemiological studies of the elderly Indian population, shows incredibly low rates of Alzheimer's compared to the western world. A possible reason for this could be that according to recent research, curcumin increases the brain's clearance of beta-amyloid plaques by macrophages, a key factor in preventing and slowing Alzheimer's disease.

With all the aforementioned benefits of tumeric, it's a shame we don't use it to spice up our lives more!

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## RED BULL...CONTINUED

In conclusion, when consuming energy drinks it is important to look at the amount of caffeine in the beverage. It is convenient to compare the amount to the 72 mg of caffeine in your typical cup of coffee and ask yourself if it would be wise to drink that many cups of coffee in such a short time. Moderation and knowledge are key when consuming energy drinks. One should also be aware of any changes in behavior or side effects that may result from the use of energy drinks when consuming them.

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## HOW NOW, NUTRIENT COW? By: ZACK HOLLIS, M3

Caring for your child can be a full time job itself. Each stage of their early development seems to come as quickly as it is overtaken by another. In regard's to a child's health and development, each of these stages comes with plenty to keep in mind. Just to start, there are the motor milestones, neurologic development, vaccinations, and nutrition.

Luckily nutrition plays a part in ensuring success in many of these. Unfortunately, there is a lot of information out there. In the new digital age of information, scores of different recommendations can be found only a click away. Many correct and incorrect "guidelines" can be found on lay websites and discussion forums. The best starting point is to discuss your child's nutrition with your pediatrician, family physician or trusted health care practitioner.

One of the most important nutritional aspects is your child's first meals. When possible, it is universally accepted breast milk is ideal for the child's first 12 months. Breast milk is a great source of nutrition and natural immunity. In fact, breast milk is rich with iron crucial for an infant's development. A deficiency in iron can result in growth, behavior, and learning impairments. Iron is essential for enzymes needed for neurotransmitter synthesis in early postnatal life. These neurotransmitters are the molecules that allow brain cells to communicate encouraging proper neurological development.

The greatest risk of iron deficiency anemia in toddlers is actually highest after the first 12 months. Coincidentally this happens when a

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## HOW NOW, NUTRIENT COW? Continued...

child should be weaned off breastfeeding. The main reason this can occur lies in the switch from breast milk to cow's milk. Cow's milk contains very little iron. Toddlers who drink a lot of cow's milk are placed at a higher risk for iron deficiency because they will be less hungry and less likely to eat other iron rich foods.

Several strategies to avoid iron deficiency in children include limited milk intake to about 16-24 ounces a day. Also serve iron rich foods that include meat, fish, enriched grains, beans, and even tofu. Since vitamin C helps the absorption of iron into the body, serving these foods with broccoli, oranges, strawberries, and tomatoes provides a nice boost. Another great strategy includes serving iron fortified cereal until 18-24 months of age.

To many people, the nutritional vigilance required during the stage of switching from breast milk to cow's milk is underestimated. Aside from an observed increase in iron deficiency in children, childhood obesity has also shown a huge increase. Obese children place themselves at a high risk for heart disease and high cholesterol. Seizing on this trend, the

American Academy of Pediatrics has changed its policy for the first time in 10 years on cholesterol testing in children to combat the epidemic trend of childhood obesity. Several studies have shown children with high cholesterol levels will continue to measure that way throughout their lives. Because of these facts, the AAP is encouraging the testing of cholesterol in children as early as 2 to identify children at risk.

A child's diet is clearly important in reducing these risks. The AAP has released new guidelines for its nutritional recommendations for infants, toddlers, children, and adolescents (see page 11). Surprisingly, milk again proves to be a point of interest, as the AAP identifies evidence of an ongoing study known out of Finland known as the Special Turku Risk Intervention Program.

In this study, children in the intervention group consumed a diet with total fat of <30% of calories, saturated fat of <10% of calories, and cholesterol intake of <200 mg/day, using 1.5% cow milk compared to their diet of pre-12 months of age. The study examined both growth and neurologic function which revealed no adverse effects of the inter-

vention diet on either. Another significant observation included lowering the LDL concentrations of boys and decreasing the prevalence of obesity in girls in the intervention groups. All of these results were exhibited using a diet of reduced-fat milk after 12 months of age.

This result comes as a surprise since much of a 2 year old or younger child's diet comes from fat. Because of this, it has been accepted dietary practice to use whole milk until the child becomes two years of age. This high intake of fat is thought to support the rapid growth and development that children experience.

Children's diets are extremely crucial to their development. To many, milk plays an unexpected role of importance. Milk is an excellent source of vitamins and calcium. In excess, milk can deprive a child of crucial iron intake. Also, whole milk can be a source of excess saturated fat in the child's diet. The increase in fat can put the child at risk for obesity and heart disease.

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## HOW NOW, NUTRIENT COW...CONTINUED

A recent study has shown a different approach of using reduced fat milk after 12 months to decrease the risk of high cholesterol and obesity while not increasing growth or developmental outcomes.

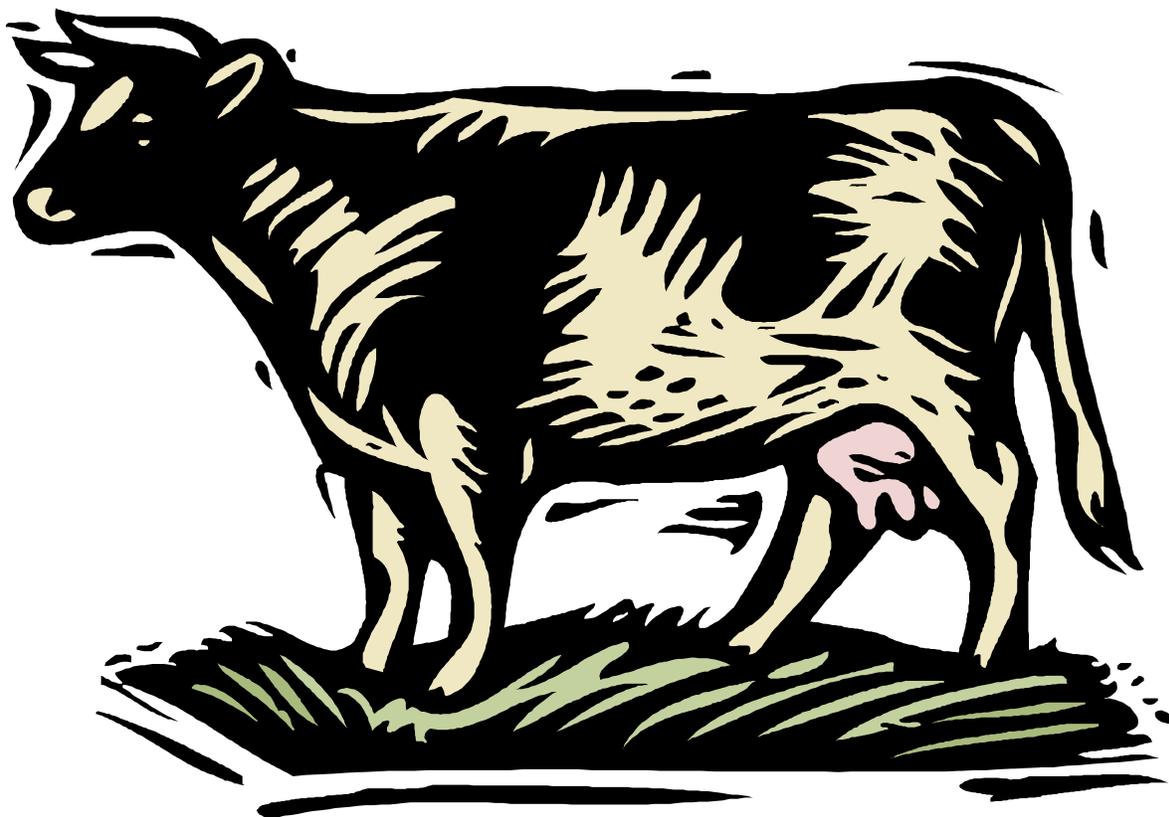
Parents should always consult with their pediatrician or family physician with questions of their child's diet. As ideas evolve about diet, including milk at the age of weaning, a pediatrician or family physician can identify those at risk and provide the best advice available.

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[http://kidshealth.org/parent/food/general/toddler\\_food.html](http://kidshealth.org/parent/food/general/toddler_food.html)



	1 y	2–3 y	4–8 y	9–13 y	14–18 y
Energy, kcal <sup>a</sup>		900	1000	—	—
Female		—	—	1200	1600
Male		—	—	1400	1800
Fat, % kcal		30–40	30–35	25–35	25–35
Milk/dairy, cups <sup>b</sup>		2 <sup>c</sup>	2	2	3
Lean meat/beans, oz		1 1/2	2	—	5
Female		—	—	3	—
Male		—	—	4	—
Fruits, cups <sup>d</sup>		1	1	1 1/2	1 1/2
Female		—	—	—	—
Male		—	—	—	—
Vegetables, cups <sup>d</sup>		3/4	1	—	—
Female		—	—	1	2
Male		—	—	1 1/2	2 1/2
Grains, oz <sup>e</sup>		2	3	—	—
Female		—	—	4	5
Male		—	—	5	6

Adapted with permission from American Heart Association. Table: dietary recommendations for children. Available at: [www.americanheart.org/presenter.jhtml?identifier=3033999](http://www.americanheart.org/presenter.jhtml?identifier=3033999).

Calorie estimates are based on sedentary lifestyle. Increased physical activity will require additional calories (0–200 kcal/day if moderately physically active and 200–400 kcal/day if very physically active [1 kcal = 4.2 kJ]). — indicates data not applicable.

<sup>a</sup> For youth 2 years and older; adapted from Table 2, Table 3, and Appendix A-2 of the 2005 *Dietary Guidelines for Americans*. ([www.healthierus.gov/dietaryguidelines](http://www.healthierus.gov/dietaryguidelines)). Nutrient and energy contributions from each group are calculated according to the nutrient-dense forms of food in each group (eg, lean meats and fat-free milk).

<sup>b</sup> Milk listed is fat free (except for children younger than 2 years). If 1%, 2%, or whole-fat milk is substituted, this will use, for each cup, respectively, 19, 39, or 63 kcal of discretionary calories and add 2.6, 5.1, or 9.0 g of total fat, of which 1.3, 2.6, or 4.6 g are saturated fat.

<sup>c</sup> For 1-year-old children, 2% fat milk is included. If 2 cups of whole milk are substituted, 48 kcal of discretionary calories will be used.

<sup>d</sup> Serving sizes are > 1/4 > cup for 1 year of age, > 1/3 > cup for 2 to 3 years of age, and > 1/2 > cup for ≥ 4 years of age. A variety of vegetables should be selected from each subgroup over the week.

<sup>e</sup> Half of all grains should be whole grains.

# Fiber Facts

## By: Nuzhath Hussain M3

Over the course of my family medicine rotation, I have seen a myriad of patients and have been struck by how many of them, in addition to their chief complaint, just cannot go! While we constantly remind our patients that eating more fiber is an easy remedy for constipation, we often fail to educate our patients on the health benefits of fiber and how easy it is to incorporate into their diet. In addition to helping prevent constipation, diverticulitis and hemorrhoids, fiber lowers cholesterol and improves blood sugars in diabetics, and reduces symptoms of damage in chronic lung disease. In our effort to provide patient-centered care, below are just a few facts about fiber that we should remind patients about in order to encourage a healthier lifestyle.

### Two types of fiber

**Water Soluble Fiber.** As its name suggests, water-soluble fiber dissolves in water and when in the intestine forms into a bulky gel that regulates the flow of waste materials through the digestive tract. Foods high in water-soluble fiber are oat bran, legumes, psyllium, nuts, beans, pectins, and various fruits and vegetables. Water-soluble fibers have been heralded as the fiber that lowers cholesterol, preventing atherosclerosis and occlusive artery disease.

**Insoluble Fiber.** In contrast, insoluble fiber cannot be dissolved in water and, therefore, cannot be digested. It is usually made of cellulose, a substance that provides rigidity to plants. Therefore, peels and skins of fruits and vegetables and the outer covering of nuts and seeds along with wheat bran are good examples of insoluble fibers that behave as natural laxatives and increase stool bulk allowing for easier bowel movements.

**Health Benefits** Fiber has been a hot topic in the research world, and the reasons for this are plentiful. Just a few examples are provided below:

Studies have shown that water soluble fiber may play a role in lowering cholesterol by preventing the reabsorption of bile acids in the intestines. In a meta-analysis of 67 controlled trials, it was found that some water-soluble fibers lower the total cholesterol and LDL without affecting good cholesterol (HDL) (Brown 1999). This is probably why some experts have touted fiber filled diets as important in preventing coronary artery disease.

High fiber diets also play a beneficial role in better glycemic control in diabetic patients. For diabetic subjects moderate carbohydrate, high fiber diets compared to moderate carbohydrate, low fiber diets are associated with significantly lower values for plasma glucose and long term hemoglobin A (1c) levels. Better glycemic control may also explain why high fiber diets have been linked to reducing inflammation and enhancing anti oxidant processes (Anderson 2000).

The American Journal of Respiratory and Critical Care Medicine published a study that foods high in dietary fiber reduced phlegm production and incidents of coughing in persons with chronic lung problems. The study is based on the assumption that chronic respiratory disease is based on exogenous oxidant exposure like smoking, and that intake of non-starch polysaccharides like fiber, especially from fruit, is inversely related to the amount of phlegm and coughing produced (Butler 2004). The findings have prompted researchers to stress the importance of a high-fiber diet along with smoking cessation to prevent chronic obstructive respiratory symptoms. See Next Page

## FIBER FACTS...CONTINUED

**How Much?** While the average American consumes about 10-15 grams of fiber daily, the actual recommendation is that men ages 50 and younger consume at least 38 grams of fiber per day, while women age 50 and younger should consume at least 25 grams per day. This amounts to about 2 cups of vegetables and 2 ½ cups of fruits daily. Beans are a great source of fiber, for example ½ a cup of kidney beans provides 8.2 grams of fiber! Also eating more whole grain bread over white bread, brown rice over white rice and multiple grain cereals like Kashi® provide the necessary dietary fiber.

Be careful! Starting a high fiber diet may prompt unpleasant symptoms like bloating, gas and abdominal cramping. Patients should be advised to start slow by changing one item in their diet and gradually waiting to see what works. Also, increasing intake of fluids will help digest the fiber intake, so remind patients should be advised to drink 8 glasses of water, tea or other low calorie drinks daily.

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## Try the following ideas to increase the fiber in your diet:

**\* Eat at least 2 cups of fruits and 2 1/2 cups of vegetables each day. Fruits and vegetables that are high in fiber include:**

- o Beans such as navy (1/2 cup = 9.5 grams), kidney (1/2 cup = 8.2 grams), pinto (1/2 cup = 7.7 grams), black (1/2 cup = 7.5), lima (1/2 = 6.6 grams), white (1/2 cup = 6.3 grams) and great northern (1/2 cup = 6.2 grams).
- o Artichokes (1 artichoke = 6.5 grams)
- o Sweet potatoes (1 medium sweet potato = 4.8 grams)
- o Pears (1 small pear = 4.4 grams)
- o Green peas (1/2 cup = 4.4 grams)
- o Berries such as raspberries (1/2 cup = 4.0 grams) and blackberries (1/2 cup = 3.8 grams)
- o Prunes (1/2 cup = 3.8 grams)
- o Figs and dates (1/4 cup = 3.6 grams)
- o Spinach (1/2 cup = 3.5 grams)
- o Apples (1 medium apple = 3.3 grams)
- o Oranges (1 medium orange = 3.1 grams)

**\* Replace refined white bread with whole-grain breads and cereals. Eat brown rice instead of white rice. Eat more of the following foods:**

- o Bran muffins
- o Oatmeal
- o Bran or multiple-grain cereals, cooked or dry
- o Brown rice
- o Popcorn
- o 100% whole-wheat bread

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