Dietary Supplements: Help or Hype?

In 2004, Americans spent \$20.3 Billion on dietary supplements, which include multivitamins, vitamins, minerals, herbs, amino acids, fatty acids, enzymes and prohormones. It is estimated that over 50% of adults in the U.S. use supplements; 56.7% of adult women and 46.9% of adult men. (NIH Office of Dietary Supplements, 2005).

Students may choose to take supplements to help meet their nutrient needs, achieve their fitness goals, promote optimal physical health, or improve their emotional well-being. There is accumulating scientific evidence that many supplements do, in fact, offer these benefits. However, there is also a lot of evidence that many supplements do not.



Effective or not, most dietary supplements will not harm you when taken in the recommended dose. But, some supplements carry significant health risks of which you might not be aware.

Read on to learn...

- If you need to take a multivitamin.
- What you ABSOLUTELY must know before you buy any supplement.
- Five Quick Suggestions for Choosing a Multivitamin.

Do You Need a Multivitamin?

Students may find themselves struggling to find the time or money to furnish a diet that covers all the essential nutrients. According to the United States Department of Agriculture (USDA) Food Pyramid (www.MyPyramid.gov), a diet that covers all the bases includes food from the 6 groups:

- 1. **Grains**: Supply lots of complex carbohydrates, fiber, some protein, plus B vitamins 1, 2, and 3 (thiamin, riboflavin, and niacin), as well as the minerals magnesium and iron.
- 2. **Vegetables**: Supply carbohydrate, fiber, folate and vitamins A. Green leafy vegetables are also good sources of vitamin K, iron, and calcium.
- 3. **Fruits**: Also supply carbohydrate and fiber, along with Vitamins A and C, potassium, and magnesium.
- 4. **Milk products**: Supply protein and carbohydrate, plus calcium, riboflavin, vitamin B12 and (if they are fortified) vitamins A and D.
- 5. **Meat, poultry, fish, legumes/beans, eggs, and nuts**: Supply protein, phosphorus, vitamin B6 and 12, iron, zinc, magnesium, niacin, and thiamin.
- 6. **Vegetable Oils**: Supply essential fatty acids and vitamin E. Make sure you don't use too much of these.

Who might not be getting enough from each of these food groups?

There are many situations in which students might not be getting enough servings from all of the food groups to meet their nutrient needs. Below are some examples:

- Students who don't choose an optimal diet on a regular basis.
- Students who are strict vegetarians.
- Students who are allergic or intolerant to certain foods (like milk or wheat).
- Students who are restricting their calorie intake to lose weight
- Students who are following a rigid fad diet that does not include certain foods or food groups.

What You Absolutely Must Know Before Buying a Supplement

- Supplements do not have to prove they work to be sold.
- 2. Supplements do not have to prove they are safe to be sold.
- 3. Supplement manufacturers can put "structure-function claims" on their labels, so long as they don't claim to "prevent" or "treat" a specific disease.
- 4. Supplements do not have to be manufactured according to any standards.

Supplements do not have to prove they work to be sold.

Before drugs or food additives go on the market, hundreds of research studies must be submitted to the FDA for review of the product's efficacy. In fact, the average evaluation of a new drug may take 15 years and cost \$800 million! (DiMasi et al, 2003) With dietary supplements, manufacturers are simply required to notify the FDA (as a courtesy) within 30 days of marketing their product. The FDA does not evaluate the research to make sure that the product does what the manufacturer claims it does.

Supplements do not have to prove they are safe to be sold.

Before new drugs or food additives go on the market, extensive research proving safety must be conducted by the manufacturer and then submitted to the FDA for evaluation and approval.

With a new dietary supplement, however, manufacturers simply need to submit safety data to the FDA 75 days before marketing it. The data need not be evaluated or approved by the FDA, so the quality of research may be questionable. If the FDA suspects that a product is unsafe and wants to take a product off the market, the FDA has to prove it is unsafe. In other words, the "burden of proof" that a product is unsafe is placed on the FDA.

Given the huge number of new dietary supplements added to the market each year and the FDA's limited resources, it is impossible for the FDA to finance and conduct safety studies for all of these products. As a result, many potentially dangerous products are sold over-the-counter to unsuspecting consumers.

Examples:

Ephedra, Ephedrine or *Ma huang*, a popular herbal supplement added to many weight loss formulas for its stimulant and appetite-suppressing effects, has been linked with over 1100 reports of adverse effects and 34 deaths since 1993. As of 2007, Ephedra has been banned, reinstated, and is in a lengthy battle to be made illegal.

Many herbs can have dangerous interactions with drugs or other supplements. But because their use is not supervised by a qualified clinician, consumers are not aware of these interactions. For instance, St. John's Wort, a popular (and potentially helpful) herbal supplement for mild depression can interfere with the action of HIV medications and birth control pills.

Supplement manufacturers can put "structure-function claims" on their labels, so long as they don't claim to "prevent" or "treat" a specific disease.

Structure-function claims can often be misleading. For example, carnitine is added to many weight loss products with the claim: "promotes fat burning." This claim is perfectly legal and somewhat true since it describes the function of carnitine in the human body. Carnitine plays an essential role in transporting fatty acids into the part of the cell responsible for producing energy. This implies that carnitine's function is to "support or promote" fat burning.

However, taking carnitine supplements does not speed up the fat burning process and it does not cause weight loss, because the healthy body knows how to synthesize carnitine and already has all the carnitine it can use.

The manufacturer can make this misleading claim by including a simple disclaimer: "This statement has not been evaluated by the FDA. This product is not intended to diagnose, treat, cure, or prevent any disease." In other words, the supplement can't claim to "prevent" or "treat" obesity (a disease)--that would imply that the supplement has drug-like actions. But, it can claim to "support" or "promote" fat burning.

In winter of1999, due to complaints from the supplement industry and consumers, the FDA relaxed its definition of what constitutes a "disease." Now manufacturers can make claims about "common conditions associated with the passage of life" such as pregnancy, menopause, adolescence, and aging. This means supplements can claim to improve mild memory loss associated with aging, but can't claim to treat real dementia or Alzheimer's disease. They can claim to ease the mood swings associated with PMS, but not treat clinical depression. Clearly this is a very fine line!

Supplements do not have to be manufactured according to any standards.

Regardless of whether or not a supplement actually does what it claims to do, you might not be getting what you think you are. Products may or may not contain the right amount of the active ingredient that was used in research studies showing a positive effect. And, even if the product label states that it has the right amount, it may actually contain much less or none at all. Contaminants that are not listed on the label may also be present.

Several independent labs are testing products' contents and finding that several don't contain what is stated on the label. One company, www.consumerlab.com, analyzes several brands of supplements for quality and purity and reports its findings on its web site. For instance, in October and November 2000, ConsumerLab.com purchased and tested 21 leading brands of St. John's Wort and found that 1/3 either did NOT contain the stated amount of the active ingredients or were contaminated with unacceptable levels of cadmium (a toxic heavy metal).

When herbs and other supplements are added to foods and beverages, it's even less likely that the right amount of the active ingredient is present. For example, to get one herbal dose of Siberian ginseng from Sobe Green Tea, you would have to drink 13-20 bottles. Ginseng is expensive, so many manufacturers may not add a therapeutic dose to their products.

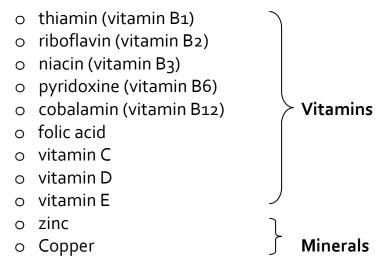
Five Suggestions for Choosing a Dietary Supplement

- 1. <u>Keep it simple. Choose one single multi vs. many</u> individual tablets.
- 2. <u>Consider a separate supplement for calcium if your diet is lacking.</u>
- 3. Look for a supplement with the USP lettering
- 4. Be sure to check the expiration date.
- 5. Take it on a full stomach.

To get the right proportion of different nutrients and to minimize adverse interactions, choose one simple multivitamin. You'll save yourself a lot of money and also the trouble of having to remember to take lots of pills! *This will also help you to avoid excesses as simple multivitamins contain less active micronutrients than individual micronutrient supplements. To play it safe, choose a multi that supplies nutrients in amounts smaller than, equal to, or very close to the recommended Daily Value (DV).*

Taken in pure concentrated form, high amounts of individual nutrients can interfere with the absorption of other nutrients. For example, zinc hinders copper absorption, iron hinders zinc, and calcium hinders iron.

Look for a multivitamin that has 100% RDA of the following nine vitamins and two minerals:



- It should also have at least 30% (25 mcg) of vitamin K, at least 120 mcg of chromium, and 100 mg of magnesium.
- Women should look for a multi with 100% (18 mg) of iron.
- Men don't need any extra iron and should look for a multi with o mg or no more than 10 mg.

2. Consider a separate supplement for calcium if your diet is lacking. Most multivitamins don't contain enough of this mineral because it is too bulky to fit into a single pill.

How much calcium do you need?

- College students younger than 19 years old need 1300 mg /day.
- Adults 19-50 years old need 1000 mg /day.
- Adults over 50 need 1200 mg / day.
- Women who are not menstruating need 1500 mg. These women are at especially high risk for bone loss because they are not producing as much estrogen, a hormone which is vital for bone health. If you are a woman who has not menstruated for 3 months or longer, consult a clinician in the Ashe Center's Women's Health Service immediately.

How do you know if you're getting enough?

Each of the following foods provides about 300 mg (or 30% of the DV) for calcium.

- 1 cup (8 oz.) of milk, calcium fortified soy milk, or calcium fortified orange juice.
- 1 carton (6-8 oz.) of yogurt
- 1½ oz. of cheese
- 1 cup pudding, custard, or flan
- 6 sardines with bones (the bones contain calcium)
- 1 Power Bar (or other sports bar that provides about 30% DV)
- 1 cup Total cereal (or other breakfast cereal with about 30% DV)

How many servings of these foods do you usually eat each day?

If you usually eat 3 or more of these foods every day (4 or more if you are younger than 20 or older than 50), you're likely meeting your calcium needs. You don't need a supplement. If you don't usually get this much, read on...

Each of the following foods provides about 100 mg (or 10% of the DV) for calcium.

½ cup cottage cheese

½ cup cream soup

½ cup ice milk, frozen yogurt, or ice cream

- 1 cup dried beans or peas
- 2 oz. (1/2 can) canned fish with bones (salmon, mackerel)
- ½ cup tofu processed with calcium
- 1/4 cup almonds
- ½ cup bok choy or turnip greens
- 1 cup broccoli, kale, or mustard greens
- 2 corn tortillas
- 2 Tbsp. nonfat cream cheese

3. Look for a supplement with the USP lettering.

Supplements may or may not be packaged in a capsule that will dissolve in your body. In 1997, Tufts University tested a variety of supplements for dissolvability and found that a few expensive, big name brands failed miserably. If a company puts "USP" on its label, it is legally responsible to the FDA for meeting the standards set forth by the United States Pharmacopeia.

The United States Pharmacopeia (USP) conducts a variety of tests on supplements to ensure the following:

- Disintegration (how fast a tablet breaks down into small pieces or at least into a mushy mass so that its ingredients can proceed to dissolve).
- Strength or potency, (whether the amount of the vitamin or mineral in the tablet actually is the amount claimed on the label)
- Purity (the pill hasn't degraded during production or been contaminated by bacteria, heavy metal, or other undesirable substances).

(NOTE: USP dissolution test does not apply to supplements that are sustained-release or timed-release, only immediate release.)

4. Be sure to chech the expiration date.

5. Take it on a full stomach.

• Some nutrients are better absorbed when your digestive tract is geared up to handle food. Also, food slows the movement of the nutrients through the digestive tract, allowing more time for them to dissolve and be absorbed.

References:

DiMasi JA, Hansen RW, Grabowski HG. The price of innovation: new estimates of drug development costs. J Health Econ **2003**; 22:151-185