What is the difference between fat- and water-soluble vitamins?

Environment, Water

There is a well of a difference between water-soluble vitamins and fat-soluble vitamins, the two classifications of the organic nutrient compounds called vitamins. The word vitamin comes from the Latin word " vita" meaning " life" and " amine", which means " nitrogen" (“ What’s the difference”, 1996). Vitamins are nutrients essential to the human (or any animal) body because their presence in minute amounts enables the completion of important physiologically related metabolic processes.

Vitamins are grouped according to the liquid or substance medium that is required for the body to be able to absorb these nutrients. Their grouping into either being soluble in fat or in water is an important determinant of how vitamins act in the body (Doctor's Responses Archive, n. d.). There are nine water-soluble vitamins, namely Vitamin C and the B vitamins B1 (Thiamine), B2 (Riboflavin), B3 (Niacin or Vitamin P/PP), B5 (Pantothenic), B6 (Pyridoxine/Pyridoxamine) and B7 (Biotin). On the other, there are four fat-soluble vitamins, which are Vitamins A, D, E and K.

The fat-soluble group needs lipid or fats in order to be absorbed through the lymphatic system (small intestines) and into the body's general blood circulation before being stored in body tissues. Fat-soluble vitamins, particularly Vitamins A and E, tend to remain in the body such that excessive intake can lead to an adverse condition termed hypervitaminosis (Doctor's Responses, n. d.). Herein, water-soluble vitamins contrasts with the other group because Vitamin C and the B group are easily dissolved in water and the excess of these micronutrients are excreted in the urine. . What are antioxidants and phytochemicals? Antioxidants are naturally occurring

substances that prevent the destructive process of oxidation and its adverse effects. Cells in all living organisms feature complex antioxidant systems that inhibit chemical damage wrought by oxidation. Antioxidant chemicals and enzymes in living organisms also help in the regulation and sustenance of various cellular processes. Antioxidants have been promoted and advertised to prevent strokes and heart diseases and even cancer.

There are antioxidants shown to have delayed atherosclerosis in experiments with animals. Observational studies in humans have established a relationship between lower incidences of heart attacks and the inclusion of Vitamin E in the diet but the more conclusive clinical trial studies have demonstrated otherwise (" Vitamins & Exercise", n. d.). Some foods with high amounts of antioxidants are mushrooms, most berry fruits, peppers and spinach, barley, pecan and pistachio nuts, coffee, teas and chocolate.

Phytochemicals or phytonutrients, on the other, chiefly refers to plant-based compounds that are not essential to the normal bodily metabolism but nonetheless promotes goodhealthsuch as by helping prevent the onset of diseases (Phytochemicals, 2006). Phytochemicals are not presently classified under nutrients because they are not indispensable to sustaining life but they are nonetheless associated with the treatment and/or prevention of cardiovascular disease, cancer, diabetesand hypertension (Dresbach & Rossi, n. d. “ How are they beneficial”). Phytochemicals and antioxidants intersect somewhat. The former necessarily come from plants but antioxidants can be found in animal-based foods. Also, vitamins, minerals and phytochemicals

can have antioxidant properties whereas phytochemicals can serve other functions other than their antioxidant features. (Collins, 2005).

What factors do you consider before taking dietary supplements?

The factors I would consider before taking dietary supplements are safety, substantiation of efficacy, costs, and product quality.

Safety should be a primary factor so as not to run counter to the very purpose of dietary supplements, that is, the improvement of one's health. I would first ask around to make sure that the touted product is generally safe and in what dosage. I'd probably also consult with a doctor or medical expert whether the particular supplement poses no adverse effects to any existing health condition of mine. Another important factor would be whether the product has at least some measure of substantiated claims of efficacy.

Outright recommendations from the medical community would be best but positive results from clinical trials conducted by reputable institutions would do for me. I would also consider whether the supplement has considerable use or history in traditional, particularly Eastern, medicine. After all, a number of important drugs used in modern medicine have been inspired by ancient traditions, including the malaria drug quinine. Costs of course is important--whether I can afford to regularly take it or I'd be better off choosing an alternative supplement.

Product quality is another important factor that I could look into by checking on the reputation and manufacturing standards of the company.

What should be the role of government, if any, in influencing your dietary decisions?

Given the assumption that the safety issue has been covered, in general, the government should at most serve to guide the public when it comes to dietary decisions. Whether the government be democratic or totalitarian, I don't believe people should be directly forced into or against eating or taking in foods and supplements that are not of their choices.

I believein freedom of consumer choice and in the individual right to decide for herself or himself what foods and supplements she or he prefers and what would work best—without need for doctor's prescriptions. However, I also firmly believe in judicious government regulation offoodand dietary supplement manufacturers and the regulation of the corresponding markets. The government should monitor companies who make or process foods and supplements, as it does manufacturers in other segments.

Government supervision should ensure that the ingredients and processes listed on product labels are accurate and that manufacturing conforms to certain quality standards. The market itself should be meticulously regulated in terms of the health claims advertised or printed on the labels. Permitted health claims should conform to standards based largely on scientific evidence that support said claims. To illustrate, the regulation by the U. S. Food and Drug Administration of dietary supplements not as drugs but as foods (Dietary Supplement, 2006,) provides the consumers the appropriate guidance to make wise decisions in their use.