NUTRITION

Nutritionally Balanced and Packaged by Nature

One has only to look around to see examples of the awesome balance of nature. Man has not always appreciated the delicate balance that nature intended. Tour guides at Yosemite National Park will tell you that for years man put out fires in the forest that were created by lightning, thinking that they were preserving the forests. Now, we realize that fires set by lightning allowed the smaller growth on the forest floor to receive sunlight by defoliating the treetops. Man in his wisdom has shown not always to understand and respect the balance of nature.

In the human body, examples of natural balance are plentiful. The human body has many homeostatic mechanisms that keep it working as a fine tuned machine that can adjust to minor changes in the environment. Regulation in blood sugar is one such example. After a meal, nutrients enter the blood encouraging the pancreas to secrete the hormone insulin. Insulin then assists the nutrients in their passage into the body cells where the nutrients are used for energy. As the nutrients leave the blood stream and enter the cells, the concentration of nutrients in the blood is diminished and activates the liver to produce another hormone, glucagon. Glucagon activates the breakdown of stored nutrients that can supply more nutrients to the blood vessels. In this way, the blood maintains a fairly constant level of blood glucose and stays within a small margin of variability. This system worked well for man when food was scarce and the body received nutrients in quantities that matched the amount of energy needed to support physical activity.

The imbalance of today's dietary intake shows little consideration for this delicate balance. We overwhelm the cells with nutrients when we eat, eating quantities beyond our needs and with increased frequency which strains the production of hormones designed to regulate nutrient balance in the body. The idea that consuming a vitamin or mineral supplement to make up for these insults shows little appreciation of this fine tuned machine.

Our ancestors probably learned the hard way to appreciate the natural balance within their bodies. Those ancient diets that included a mixture of nutrients from a variety of sources provided our ancestors with health and strength. Those diets that were lacking in essential nutrients kept the culture from progressing and defending themselves from predators. One can learn a lot from the food ways of our ancestors. It is no surprise that the mixture of rice and beans, a staple of the Hispanic culture makes two incomplete proteins complementary. Our bodies only use

continued on page 2

In This Issue...

continued from front page

proteins that provide all the essential amino acids. By combining two proteins that are missing different amino acids, a complete protein is formed. This same principle is practiced by those who consume an Asian diet of soy and wheat products as well as an American favorite, peanut butter and jelly sandwich on wheat bread.

One must wonder what great body of research supports a diet that severely restricts intake of one macronutrient like carbohydrate or even fat. Certainly the generations of healthy offspring that survived on diets including a variety of nutrients in adequate amounts, is testimony to the soundness of a well balanced diet.

Does this mean that improvement is impossible? Can it be that with all the progress we have made in medicine and the sciences, our diet is best when it resembles that of our great grandparents'?

The answer is both yes and no. It would be wise to model our intake after the successes of our ancestors; however, our lifestyles have changed. Manual labor required considerably more calories than our current "computer oriented" lifestyles. Our goal however, should be the same: to meet our body's nutrient needs with enough reserves to develop defenses from predators, which in our case may be a virus or bacteria.

Perhaps it is time to step back and consider how best to provide nourishment for this well designed machine while keeping in mind that eating can be as pleasurable as it is functional.

Foods	Phytochemical	Food Component, Vitamin or Mineral	Potential Benefit
Apples	Flavonoids	Fiber	Anticancer properties, protect against cardiovascular disease
Beans		Folic acid, iron, potassium, zinc, fiber	May reduce risk of some cancers and cardiovascular disease
Beef	Conjugated linoleic acid	Vitamin B12, iron, Zinc,	May decrease risk of certain cancers
Broccoli, kale, Brussels sprouts	Ellegic Acid	Vitamin C, folate, fiber, selenium	Anticancer properties, protective against heart disease and stroke
Carrots and red/yellow vegetables	Carotene	Vitamin A	Protects eyes and lungs from environmental damage, vision
Dairy Products	Sphingomyelin	Calcium	May inhibit tumor cell growth, bone health,
Eggs, whole	Lutein and Zeaxanthin, Choline	Vitamin A,D,E, B12, Zinc, Iron Folate	Protects eyes from macular degeneration, improves fetal brain development,
Fish	Omega-3 fatty acid	Vitamin B12,	Improves heart health,
Green Tea	Polyphenols		May help block damage to DNA, Reduce cancer risk, promotes heart health
Tomatoes and tomato products	Lycopene	Vitamin C, Vitamin A	Antioxidant, may reduce cancer of prostate risk

Published By :
Egg Nutrition Center

QUESTIONS FROM the clinic

Q: What are functional foods?

a: There is not a legal definition at this time but generally, functional foods refer to a food or its components that promote health, prevent disease or both. Often a functional food offers some health benefit beyond meeting basic nutrient needs. An example of a functional food is salmon, which due to its omega-3 fatty acid content is believed to lower cardiovascular disease risk.

Q: What health benefits do functional foods provide?

a: Functional foods are often touted for their ability to reduce cancer risk, aid digestion, maintain eye health and reduce the risk of cardiovascular disease.

The chart on page 2 lists some functional foods with potential health benefits.

Q: How do I fit more functional foods into my diet?

a: Regular consumption of functional foods is the best way to receive any potential health benefits. Since appropriate dosage of the functional food components have yet not been established in most cases, this would mean eating foods from all food groups in the Food Guide Pyramid within a day and varying the members within each food group that you consume. In this way you will reap the health benefits of many different functional foods. It is unwise to eat one food group to the exclusion of others. If calorie limitations are necessary, reduce consumption from the added fats, oils and sweets group on top of the Food Guide Pyramid.

Q: Does anyone regulate functional foods in the marketplace?

a: The United States currently has no specific regulations or standards for functional food claims since they are regulated as are other food products. If a manufacturer wishes to make a claim about a nutrient on their food product label, they are responsible, as would any food product, for substantiating their claim and assuring that the claim is truthful and non-misleading to consumers.

However, if a claim is made about a functional food, implying it can cure an illness or influence the natural structure or function of the body, then it is considered a drug and must go through a rigorous approval process by the Food and Drug Administration.

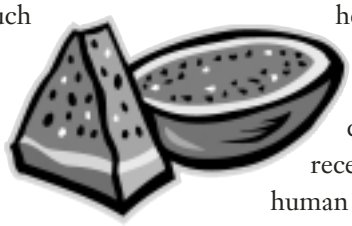
Nutrition Realities welcomes your Questions from the Clinic. If you have questions or comments, please send them by mail, FAX, or e-mail to:

Questions from the Clinic
Nutrition Realities • Egg Nutrition Center
1050 17th St., NW • Suite 560 • Washington, DC 20036
FAX: (202) 463-0102 • e-mail: enc@enc-online.org

Nutrition Realities

Nature's Functional Food

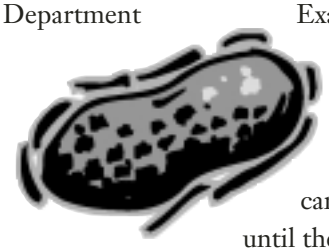
Since nature has been evolving for millions of years, it is not surprising that man has not yet unraveled many of nature's mysteries. One such mystery is, whether food provides nutrients that we have not yet identified or been able to fully define their functions. When nutrients are artificially added to a food product that was not found together in nature, they may not be as useful or as available to your body. Likewise, when a food source is artificially fortified with excessive nutrients beyond the food's naturally balanced nutrient content, the nutritional value to your body may be altered or compromised. Caution should also be used when depending on a single source of nutrition, such as a nutrition bar to meet most of your body's nutrient needs.

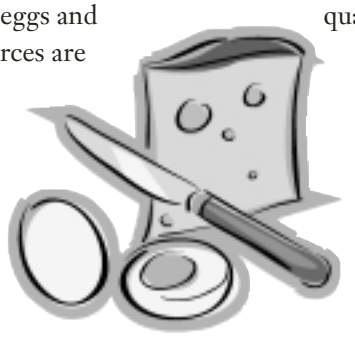


One reason that caution is recommended when selecting your food is that scientists are just beginning to understand the role of the many phytochemicals found naturally in foods, and how they make the foods more functional.

By definition, a functional food can be considered to be one that provides additional physiological benefit beyond that of meeting basic nutritional needs. This definition indicates that foods offer benefits to your body that go beyond meeting established nutritional needs. For example, the carotenoids lutein and zeaxanthin make eggs and certain dark green vegetables functional foods because of their role in preventing age-related macular degeneration. Age related macular degeneration is a leading cause of vision loss in the United States and affects up to 30% of those over age 75 years. Lycopene, another carotenoid found in foods such as tomatoes, grapefruit and watermelon, is thought to lower the risk of certain chronic diseases including cancer and heart disease. Again, functional foods illustrate the need to eat a diet that offers variety and balance for optimal health.

Preserving and maintaining optimal health may be one of your life's goals but improving health can readily be another. The dietary component choline, which has recently been found to be essential for human cellular function, has been shown to improve the quality of life. Choline is known to be necessary for synthesis of an important neurotransmitter, as a component of cell membranes, facilitate normal liver function and plays an essential role in fetal brain development. Dr. Steven Zeisel of the Department of Nutrition, School of Public Health, University of North Carolina at Chapel Hill, in laboratory studies with animals has been able to show that choline supplied during fetal brain development can enhance spatial memory, with enhancement extending throughout life and into old age. Good sources of choline include milk, liver, eggs and peanuts. These sources are especially important for pregnant and lactating women.





It should be noted that nutrients in isolation do not provide the same benefits as when found together in nature. Conversely, some nutrients that may increase health risk when consumed alone are safer when consumed with other nutrients that appear to be protective. This point is clearly demonstrated when choline, lutein and Vitamin E in eggs are made more bioavailable in the natural presence of a fat source. Strictly limiting the fat in one's diet has many consequences beyond decreasing obesity as a health risk factor. Since vitamins A, D and E are only found associated with fat sources their important antioxidant functions might be lost when fat intake is minimized.

The suggestion that dietary cholesterol may lead to increased heart disease risk has been called into question as well. Recent research shows, that dietary cholesterol in foods such as eggs, which are relatively low in saturated fat, is not responsible for your body's internal over supply of plasma cholesterol. Song et al. (2000) found after reviewing data from the National Health and Nutritional Examination Survey (NHANES) involving 27,378 subjects, that egg consumption was unrelated to serum cholesterol concentration. Clearly, nutrients can offer risks as well as benefits and until the scientific community unravels all the mysteries of the human body, we are safer consuming nutrients in foods as nature supplies them.

These examples show how the balance of nature's own food supports the best quality of life.

NUTRITION realities

Executive Editor:
Donald J. McNamara, Ph.D.

Writer:
Marcia D. Greenblum, M.S., R.D.

ENC
EGG NUTRITION CENTER
1050 17th Street, NW Suite 560
Washington, DC 20036
(202) 833-8850 Fax: (202) 463-0102
e-mail: enc@enc-online.org

What kind of Vegetarian Are You?

If you are starting to wonder if maybe there's something to a vegetarian diet, it may be time to look a little deeper. Perhaps you've noticed more products in the store that are meat free/made with soy and were thinking about trying them. Does this mean you are liable to become a vegetarian? It's time to look at what a vegetarian diet can offer.

Vegetarian is a term given to a diet that avoids foods from any animal source. There's a wide variety of vegetarian diets ranging from only plant based foods to all foods except a specific animal source such as beef, pork, veal or eggs. There seems to be as many variations of vegetarianism as there are reasons for consuming a vegetarian diet. Some of the more popular beliefs include religious conviction, environment concerns, animal welfare, and health benefits. Some health benefits of vegetarianism are that serum cholesterol and blood pressure levels are often lower in vegetarians, vegetarians often weigh less and the rate of non-insulin dependent diabetes is lower amongst vegetarians.

Most vegetarians who include food other than plant sources do not have problems meeting their nutrient needs. Strict vegetarians however, need to plan carefully to meet their needs for protein, vitamin B12, vitamin D, iron, zinc and calcium. Some vegetarians rely heavily on meat substitutes or textured vegetable protein to meet their protein needs. Since these foods are plant based they are most often incomplete protein sources. These vegetarians would be wise to combine complementary foods, such as grains and legumes to obtain all of the essential amino acids that they need. A simple flow chart that follows shows how to combine complementary proteins to attain a more complete protein.

Some vegetarians enthusiastically eat seaweed, fermented soy products, and other products believing they supply needed amounts of vitamin B12. Soy products are considered good sources of vitamin B12, which is only found naturally in animal products, only if the products have been fortified with the vitamin. Other sources of vitamin B12 are fortified soy milk, meat analogs or yeast grown in the presence of vitamin B12. Caution is advised that unless the vitamin B12 of such products is laboratory tested, they can not be considered reliable sources.

A vegetarian that consumes no vitamin D fortified milk or milk products may find it hard to meet their vitamin D needs. Eggs are one of the few foods that naturally supply vitamin D. Exposure to sunlight can also help meet the vegetarian's needs for vitamin D.

Since certain green vegetables contain oxalic acid they may not provide calcium as

well as green vegetables with lower oxalic acid levels, for the vegetarian who doesn't drink milk or consume dairy products. Vegetables such as broccoli, kale, collard and mustard and turnip greens are considered the best sources of calcium among the green vegetables.

Iron status is often a major concern for all types of vegetarians. Good vegetarian

sources of iron include legumes (dry beans and peas), whole and enriched grains such as brown rice, dried fruits, dark leafy vegetables, tofu, and nuts and seeds. Iron absorption may be enhanced, by combining the intake of an iron source with a vitamin C source. This practice should be encouraged for all vegetarians.

Meeting the body's needs for zinc should not be difficult if the vegetarian consumes plenty of milk, eggs and whole grain products. A strict vegetarian can have difficulty consuming adequate zinc from grain products and legumes. Whole grains contain phytates, which bind some zinc and prevent its absorption. When grains are refined, some of their zinc is removed during processing. Supplemental zinc may be necessary if the intake of legumes, which are relatively low in zinc, is not adequate.

Keeping in mind nature's balance, the exclusion of any food group makes it difficult to meet the body's nutritional needs. For the non-strict vegetarian that eats any mixture of the following: eggs, milk, fish, poultry, and meat, meeting nutrient needs can be fairly easily accomplished, with some dietary planning.

From Nature with Balance

Within your body, balance is achieved by countless chemical reactions occurring while you sleep and while you are active. For these chemical reactions to proceed properly, specific nutrients are required. Many complex digestive pathways are involved in helping your body to liberate nutrients from the foods that you consume.

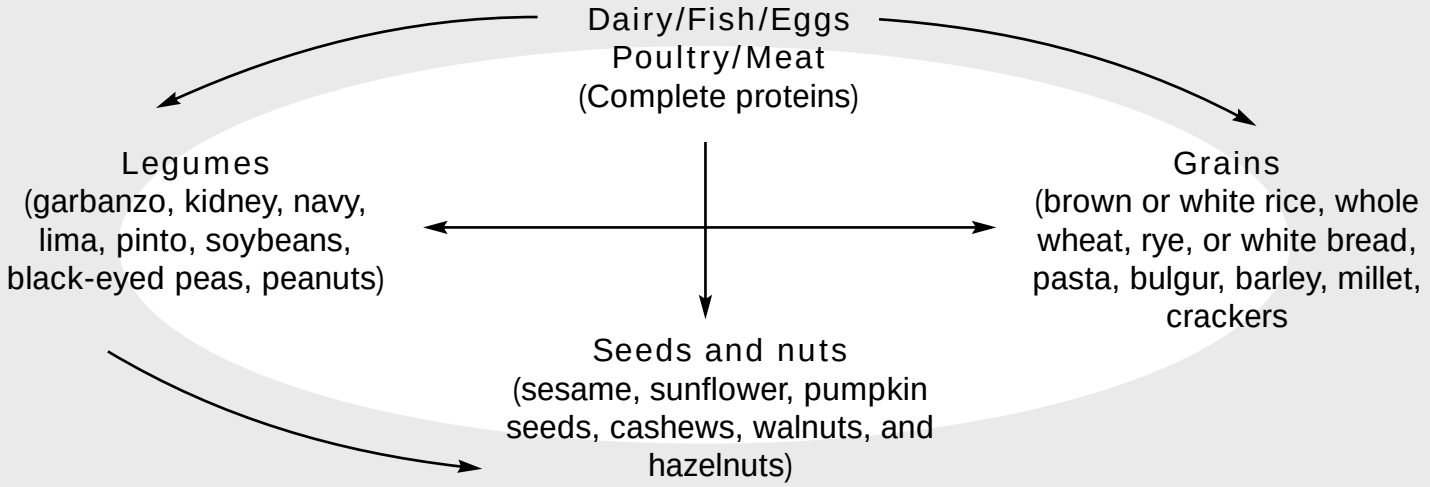
For instance, in the stomach the presence of food stimulates secretion of acid that allows for the breakdown of proteins in food. The right amount of stomach acid will be secreted to make protein more available to the body. Stomach acid also has a beneficial effect on nutrient absorption. Vitamin B12 is one nutrient that becomes more available when stomach acid is present. Seniors who generally produce less stomach acid and those who restrict their intake of animal products, which supply vitamin B12, are less able to absorb vitamin B12. Because vitamin B12 is required to convert folate, another B vitamin, to its active form, the risk of both pernicious anemia and irreversible neurological damage is a concern for the elderly.

Within foods, there are balances as well. Certain foods contain a plentiful supply of essential nutrients but are bound to and made unavailable by dietary factors in the foods. The absorption of minerals such as calcium from vegetables and whole grains can be at least partially blocked by substances in the foods known as phytates and oxalates. Iron is another essential mineral that is far better absorbed by our bodies from animal sources than from vegetable or grain sources. When beverages such as tea and coffee are consumed with foods that provide iron, absorption of iron is reduced, due to their tannic acid content. This demonstrates how nutrient absorption from animal products is often superior to that from vegetables or grains and how each food source makes unique contributions to meet the body's nutrient needs.

The enhanced absorption of calcium in the presence of vitamin D is another example of nutrient balances within our food supply. When foods such as eggs contain a multiplicity of nutrients in small quantities, each nutrient acts to enhance the absorption and utilization of another. Certain nutrients compete for absorption however zinc and copper, two essential minerals, require the same protein carrier to be absorbed and when one mineral is available in excess supply, it can replace and therefore limit the absorption of another essential nutrient. It is clear to see that moderate amounts of each nutrient when consumed together can offer the most nutritional benefit to the body.

These examples illustrate the complexity of nutrient balance and the value of eating a diet that provides a full complement of nutrients. In fact, consuming a source of vitamin C with an iron source will make the iron more available for absorption by the body. Vitamin C can be found in most citrus foods as well as dark green leafy vegetables. Consider a salad of fresh spinach leaves, sliced hard cooked eggs and orange sections to increase not only your total nutrient intake but also the nutrient bioavailability.

To make the most complete proteins, combine food sources as indicated by the arrows.



Example of complete proteins:
Rice and bean taco
Spaghetti with garbanzo beans
Egg fried rice with sesame seeds and tofu