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Module 2: Nutrition



ACADEMY OF QUEST FOR HEALTH®

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Module 2

Education with Excellence

2.0 Nutrition Building Blocks

The essential nutrients include water, carbohydrates, proteins, fats, vitamins, and minerals. We need all of these substances to maintain healthy functioning.

Disease can develop without sufficient of balanced intake of any of these vital nutrients.

2.1 Water

The body is comprised of about 70 percent water. Our blood is 90 percent water. We are constantly losing water in various ways-when we breathe out, we exhale water, and each day, in a temperate climate without exercising strenuously, we lost about half a liter through sweat glands. As well, our stool contains 75 percent. All of this lost water has to be replaced. Some of the water we drink will show up in our urine only 15 minutes later, which means it has already been pumped through the body by the heart and filtered by the liver and kidneys. In the body, water is involved in almost everybody processes, including digestion, circulation, elimination, and transportation of nutrients. The liver and kidneys need a lot of water to flush out metabolic wastes. The blood needs water to move out toxins, and the intestines need water to achieve proper elimination.

At least eight glasses of water are needed daily to ensure proper functioning of the body's many systems. Water can also be taken in the form of freshly pressed fruit or vegetable juices, juices, vegetable broths, or herbal teas. The ideal source is pure, natural spring water, but an effective water filtration system at home will help to remove chemicals and heavy metals that may be in the water supply. Water provides the trace elements we need and helps to maintain the acid-alkaline balance in the body. Many common ailments such as headache, fatigue, and constipation may be alleviated by drinking more water.

2.2 Macronutrients

The bulk of what we need to function is referred to as macronutrients. These include proteins, carbohydrates, and fats. We call them macro because we need them in fairly large quantities to support normal functioning, and daily requirements are measured in grams. A calorie, which is Latin for "heat," is the measurement used to determine the energy value of macronutrients.

Our ideas and understanding of what constitute a healthy diet have changed drastically in the last few decades. Expert opinions vary widely regarding the ideal ratio of proteins, carbohydrates, and fats we should consume for the most balanced diet.

Meat and dairy protein sources of usable protein. We were taught to eat meat at virtually every meal. Now, experts are encouraging us to eat more vegetable-source

Proteins from soy foods, lentils, and other legumes.

Carbohydrates used to be thought of as just starches.

There was no consideration of the differences between complex and simple carbohydrate sources. Today, many people understand the importance of choosing more complex carbohydrates to sustain energy levels and increasing fibre intake.

The way we view fats has undergone the most radical change of all. We have moved beyond grouping all fat into one category and have begun to understand the role of essential fatty acids and to distinguish between the beneficial and unhealthy sources of fat.

2.2.1 Proteins

The body utilizes proteins from foods to build, maintain, and repair tissues, to provide protection from disease, to communicate between cells, to guide and control metabolism, to provide structure and movement and to sustain the fluid balance in the body. After water, protein is the most plentiful substance in our bodies. It constitutes about one-fifth of our body weight and is the major constituent of every living cell and body fluid except bile and urine. The caloric content of a gram of protein is four calories, the same as a gram of carbohydrates. The most common food sources of protein are meat, fish, fowl, seafood, eggs, dairy products, whole grains, and legumes (beans, peas), and soy-based foods such as tofu and tempeh. You will learn more about proteins in Module 3.

2.2.2. Carbohydrates

Carbohydrates are the body's main source of fuel.

Contrary to what fad low-card diet proponents say, we need carbohydrates to be truly healthy. Many will see that, over time, avoiding carbohydrates can result in deficiencies and disease. A lack of carbohydrates could result in energy loss, ketosis, depression, nutritional deficiencies, and loss of essential body protein. Of course, eating the right kinds of carbohydrates is important. Formed by green plants as a product of photosynthesis, carbohydrates are the most abundant compounds on Earth, consisting primarily of starch, sugar, and fibre. Simple carbohydrates are naturally occurring sugars and include glucose, fructose, galactose, sucrose, lactose, and maltose. All carbohydrates are eventually broken down into glucose, which is absorbed directly into the bloodstream. Glucose is what the body uses for energy and what the brain requires to function.

Simple carbohydrates also include table sugar, honey, natural fruit sugars, and molasses. The many hundreds of processed foods on the market can usually be considered unhealthy. Baked goods, white flour, white rice, boxed cereals, chips, and candy are all processed and behave as

sugar in the body. Eating sugary treats and processed foods can lead to obesity, hypoglycemia, and processed foods can lead to obesity, hypoglycemia, and diabetes. The consistent consumption of these foods wreaks havoc with the body's blood sugar levels, leading to insulin intolerance. These foods also lead to cravings for more because they leave the system devoid of essential nutrients.

Excellent sources of complex carbohydrates include whole grains, legumes, vegetables, and fruits. It is from these foods we receive sustaining energy and essential nutrients. Complex carbohydrates are also eventually broken down in the body to single glucose molecules; however, they are digested much more slowly than simple carbohydrates, allowing a sustained and level amount of sugar and nutrients into the system to keep the body functioning and optimally nourished.

We also receive our fibre from complex carbohydrates. Sufficient intake of fibre has been shown to enhance elimination and detoxification, lower blood fats, balance sugar levels, boost energy, improve immunity, and minimize risks of digestive and bowel disorders.

A significant increase in dietary fibre may cause temporary intestinal distress such as bloating, flatulence, or diarrhea. These symptoms will subside as the digestive system adjusts to the increased fibre.

After carbohydrates are broken down into glucose, all the excess not immediately required for energy is stored as glycogen in the muscles or liver. The muscles can then readily use the stored muscle glycogen, while the glycogen stored in the liver can be released as glucose (blood sugar) and transported by the bloodstream. If these two storage areas are full and there is no bodily requirement for more carbohydrates, excess glucose is converted by the liver into body fat.

2.2.3 Fat

We need dietary fat for energy storage, insulation, healthy cell membranes, absorption of fat-soluble vitamins, and protection of the nervous system. Fats have received a bad rap, but not all fats are created equal, for instance, omega-3 and omega-6 fatty acids, which are essential for health. Fats will be discussed in greater detail in Module 3.

2.3 Micronutrients

Micronutrients are required in small amounts by the body to support normal functioning and help regulate many physiological processes. They include vitamins and minerals. Vitamins are organic substances, meaning they contain carbon and can be classified as either fat-soluble or water-soluble. Minerals are inorganic substances, meaning they do not contain carbon and can be classified according to the body's requirement for them: major or trace. You will learn more about vitamins and minerals in Module 4 and 5 respectively.

2.3.1 Fat-soluble vitamins

The fat-soluble vitamins require the presence of dietary fat to be absorbed in the intestine and are therefore not as easily assimilated as water-soluble vitamins. Fat-free diets interfere with the metabolizing of these vitamins since fatty acids are needed for their absorption. Once fat-soluble vitamins enter the bloodstream, they are stored in the tissues. There are four fat-soluble vitamins known to be essential to health: A, D, E, and K.

2.3.2. Water-soluble vitamins

B vitamins and vitamin C are easily assimilated because they dissolve in water. Since excess vitamins are eliminated through the urine, they need to be replenished more often than fat-soluble vitamins. There are nine water-soluble vitamins known to be essential for health: vitamins B1, B2, B3, B6, B12, pantothenic acid, biotin, folate, and vitamin C.

2.3.3 Minerals

Minerals are essential to the human body. Some of these regulate the water and acid-alkaline balance in the body, which is vital to supporting life. Minerals provide structure to our skeletal system and promote nerve impulses, along with a multitude of other functions. These minerals include calcium, chloride, magnesium, phosphorus, potassium, sodium, sulphur, iron, zinc, copper, manganese, fluoride, chromium, molybdenum, selenium, and iodine.

2.3.4 Why take micronutrient supplements?

Today, many North Americans take supplements to ensure they are getting all the nutrients they need, whether they are eating well or not. While blatant deficiencies resulting in illnesses such as scurvy (lack of vitamin C) or beriberi (lack of vitamin B1) are rare, mild deficiencies are common and can lead to vague symptoms of fatigue, lack of initiative, and poor concentration.

A number of causes contribute to these mild deficiencies. Erratic eating habits are one of the most common culprits in today's hectic lifestyles. Efficient digestion and assimilation of nutrients tend to decline as we age, which can result in deficiencies of many essential nutrients.

Processing, cooking, and preserving food leads to nutrient depletion. Many fruits and vegetables are genetically bred to improve yields, look appealing, and withstand a long transport; taste and nutritional value become secondary. Nutrient-depleted soil is also unable to provide fruits and vegetables with the high amounts of vitamins and minerals they contained in the pre-industrial age.

Food supplements also compensate for individual nutrient requirements. Pregnant women typically need more folate, iron, and other nutrients. Strict vegetarians often need additional vitamin B12, and possibly calcium, iron, and zinc. Older people tend to lack vitamins B6, B12, folate, and calcium. Menopausal women dealing with the symptoms of osteoporosis need more minerals to supplement those lost through bone depletion. Fitness enthusiasts also require a variety of nutrients to maintain strength and stamina.

Stress has a tremendous impact on the function of the entire body, affecting heart rate, hormonal output, and metabolism. As a result, essential nutrients are used up more quickly

than usual. Environmental pollutants in our air, water, and food also contribute to an accumulation of toxins that our bodies must work to eliminate. Supplements may provide adequate essential nutrients to protect against the impact of toxins and to help the body detoxify.

2.4 A Healthy Diet

Serious concerns over the quality of the foods we eat have given rise to a growing number of health-conscious citizens willing to take responsibility for improving their own well-being. There is abundant evidence to show that an optimal level of nutrition can extend lifespan and improve quality of life. The nutrients in our food are used by the body to promote normal growth, maintenance, and repair.

Creating optimal health through a well-balanced diet is basically a twofold approach. One must stop unhealthy behaviours and increase healthy behaviours. This combination of protecting ourselves against disease by avoiding nutritional pitfalls and increasing our intake of beneficial foods are steps toward better health.

Many people get hooked on junk food. Processed-food manufacturers use hundreds of artificial flavours, colours, sweeteners, and other additives to make us think that we are eating something good. Over time, the natural appetite can be thwarted by years of eating artificial, highly processed foods. Even some of the foods we think are healthy may be highly processed and made with unhealthy ingredients.

Whole food naturally provides the correct balance of nutrients required by our cells. The most nourishing foods are those fresh from the garden. The more a food is altered, processed, or packaged, the less nourishment it provides.

Our bodies need natural, unprocessed foods. With their abundance of vitamins, minerals, antioxidants, phytochemicals, and enzymes, whole foods are more important than ever to keep us healthy and full of energy.

2.5 Organically and Locally Grown

Organic food is grown or produced without using harmful pesticides, fungicides, or chemical fertilizers. Many approved pesticides were registered long before extensive research linked these chemicals to cancer and other diseases. A number of agricultural and household pesticides still in use are believed to be known, possible probable, or likely carcinogens or neuroendocrine and thyroid hormone disruptors, according to a report by the US Environmental Protection Agency (Chemicals Evaluated for Carcinogenic Potential, Science Information Management Branch, Health Effects Division, Office of Pesticide Programs, US Environmental Protection Agency, 2006)

Certified organic grown foods means that an independent certifying agency has regularly inspected the farm on which the food was grown to ensure that water and soil meet standards for producing organic food. All food can be produced organically, including fruits, vegetables, herbs and spices, grains, beans, seeds, nuts, meat, and dairy products. Organic farming is a

sustainable way to grow food as it protects the earth's water and soil and does not harm the wildlife and plant wilderness that are so crucial to our environment.

Since water makes up two-thirds of our body mass and covers three-quarters of the planet, we should be concerned with the state of the water that is running off the fields and into our water supply. From the farm to the grocery store, organic growers and processors use practices that eliminate polluting chemicals and nitrogen leaching, and thus protect and conserve precious water resources. Many futurists and experts are concerned about our water supply and advise that organic farming will be the only acceptable means of producing food in the future.

The soil in which food is grown is the source of our minerals and foundation of our food chain. Soil is the most revered tool for organic production, built through natural means such as composted manure and by planting diverse crops, rather than relying on synthetic fertilizers. The Natural Resources Conservation Service estimates that 2.7 tons of topsoil per acre is eroded from American crop lands annually (National Resources Inventory 2001 Annual NRI, Soil Erosion, Natural Resources Conservation Service, July 2003). The cause? Intensive monocropping (planting the same crop in the same field over and over again, thereby leaching the same nutrients required over and over again) and chemically intensive practices are to blame.

The loss of a large variety of species (biodiversity) is one of our most pressing environmental concerns. Many organic growers have been collecting and using heirloom seed varieties for decades. On the other hand, many conventional farms still grow hybridized vegetables and fruits, bred for uniformity, ease of shipping, and cosmetic appearance. Such modern concerns have ignored the value of preserving a diversity of seed varieties, and, therefore, a more balanced ecosystem.

A number of studies have found that farmers exposed to herbicides are at greater risk than nonfarmers of developing several types of cancer. Field workers on conventional farms, because of their direct exposure, are the most vulnerable to illness as a result of pesticide use. Organic farms eliminate that risk by excluding harmful pesticides and other chemical inputs from their practices. Organic practices encourage wildlife by including forage crops in rotation and by retaining fence rows, wetlands, and other natural areas. Removing synthetic, toxic inputs helps to make an organic farm a lively place.

Organically grown foods may seem more expensive, but retail prices are deceptive. The price of conventionally produced foods doesn't reflect the costs of federal subsidies to conventional agriculture, the cost of contaminated drinking water, the cost of loss of wildlife habitat and top soil, or the cost of disposal and cleanup of hazardous waste generated by the manufacture of pesticides. Buying organic food and products is a direct investment in a more sustainable environment.

Making an effort to purchase locally grown foods, when possible, is an environmentally and nutritionally sound decision. Buying local produce also helps your local economy.

It's estimated that the components in the average North American meal travel between 2,500 and 4,000 km from field to table. Those kinds of transportation distances mean increased production of greenhouse gases and air pollution. Shipping food long distances may also necessitate chemical treatment and packaging of the food to prevent ripening before it reaches market. Fresh, untreated food tastes better and has been found to contain higher levels of nutrients.

2.6 A Whole Foods Diets

Whole foods have not been processed, preserved, refined, frozen, canned, polished, bleached, preserved, otherwise stripped of nutrients. Whole food does not contain preservatives, additives, unnatural flavours, or colours-nothing has been added or taken away from it. In short, whole food is the best possible food for your body. Whole foods include fruits, vegetables, whole grains, nuts, seeds, and beans.

2.6.1 Vegetables

In their colorful and flavorful variety, vegetables are rich in complex carbohydrates, a great source of food energy. Low in fat and high in fibre, vegetables also provide the enzymes, vitamins, and minerals that are essential for body functions, including complete and proper digestion. They are the perfect complement to proteins and aid in protein digestion.

Nutrients called phytochemicals are a determining factor in the color and flavor of vegetables. They act as the plant's natural immune system, warding off disease and viruses. These same phytochemicals help increase our body's immunity, and studies suggest they support the body's ability to remove toxins.

Dark green vegetables such as spinach, collard greens, kale, and leeks are particularly nutritious, providing iron, folate, vitamin B2, vitamin C, and other nutrients. The members of the cabbage family (cabbage, broccoli, cauliflower, Brussels sprouts, and Chinese cabbage) are rich in vitamins and minerals valuable for prevention of cancer.

Root vegetables are winter favorites as they provide energy and can be stored for a long time. Dark yellow and orange vegetables, such as pumpkins, winter squash, carrots, beets, and yams, keep eyes and skin healthy. Local vegetables, as determined by the regional climate, are best suited to the needs of the body and digestive system. Among the many nutritious North American vegetables are carrots, broccoli, kale, dandelion-related salad greens, green beans, corn, cauliflower, squash, onions, and garlic. Garlic and onions should be eaten liberally to take full advantage of their plentiful healing and immune-boosting properties.

Some of the wild plants growing in and around our gardens can be picked in the early spring and eaten as delicious greens. Typically, these plants have cleansing properties. The young leaves of dandelion, stinging nettle, and lamb's quarters can be combined in a salad for a burst of vitamins, minerals, and taste.

Green and yellow vegetables

These colorful foods are known to store most of their calories in complex carbohydrates and their total caloric value is low. They are an excellent source for vitamins, minerals, protein, unsaturated fats, chlorophyll, and antioxidants. Consumption of cruciferous vegetables can dramatically prevent disease, especially cancer and heart disease. The green leafy vegetables are powerful immune boosters that ward off disease.

Cruciferous vegetables •••••

- broccoli
- kohlrabi
- cauliflower
- kale
- turnip
- radishes
- rutabaga
- cabbage
- watercress
- Brussels sprouts
- mustard greens
- horseradish

Sprouts

The energy contained in the seed that enables it to push through the ground to become a plant is chock full of vitamins, minerals, and enzymes. The sprouting process releases these valuable nutrients from beans, seeds, and grains. Sprouts, therefore, are a fresh, inexpensive source of greens in the winter months or any time of the year. Try sprouting soybeans, lentils, clover, alfalfa, sunflower seeds, buckwheat, or other seeds and beans. Sprouts are most nutritious if they have been exposed to the sun after germination; with sun exposure, sprouts turn green, producing chlorophyll.

Sea vegetables

Vegetables from the sea are particularly valuable and deserve a more important place in our diets. Each type contains a rich source of vitamins, minerals, and trace minerals. Sea vegetables such as dulse, nori, kombu, and wakame are extremely rich in vitamins, amino acids, and minerals, containing 10 to 20 times the minerals of land vegetables. Seaweeds are especially rich in iodine, calcium, iron, and vitamins.

The most popular sea vegetables are dulse (harvested off the coast of Canada in the northern Atlantic) and nori (widely used in Japan), which is most commonly used for making sushi.

2.6.2 Legumes

A special category of vegetables, legumes grow in a pod. They include beans, chickpeas, peas, soybeans, and lentils. Legumes are a rich source of protein, iron, calcium, zinc, B, vitamins, and fibre. They also contain a substance called genistein, which has been shown to inhibit the spread of cancerous tumours.

Legumes are extremely versatile and can be prepared in dozens of ways including baked, in soups, casseroles, stews, vegetarian patties and burgers, and even in milks such as soy milk. Beans and lentils are a main food staple in many parts of the world. Mexican, Chinese, and Middle Eastern cultures consume legumes on a daily basis in a variety of forms. Beans, which are approximately 70 percent complex carbohydrates, are known to significantly lower cholesterol levels, control insulin and blood sugar, lower blood pressure, alleviate bowel disorders, and prevent colon disorders.

Before cooking legumes, soak one-part legumes in four parts water for 12 hours or overnight. Soaking legumes makes them easier to digest. Throw away the soaking water, and use fresh water to cook them in. This softens the skins and begins the sprouting process.

Remove and discard any foam that forms on the water while cooking. A little lemon juice or apple cider vinegar added to the water before serving aids digestibility. A weak digestive system may not have sufficient enzymes needed to break down legumes properly. If beans are being used in a salad, marinate the cooked beans in apple cider vinegar and olive oil. Vinegar breaks down protein chains and indigestible compounds.

Eat only small amounts of legumes at first, chewing well to encourage the body's own formation of the enzymes necessary to digest them.

Legumes

- adzuki bean
- anasazi bean
- black turtle bean
- fava bean
- garbanzo bean (chickpea)

- great Northern bean
- lentil
- lima bean
- navy bean
- peas
- pinto bean
- red kidney bean
- soybean

Soybeans

Soy food products are an excellent complete protein source. They also provide essential fatty acids, especially the rarer of the two, omega 3. In addition, they contain calcium, iron, potassium, B vitamins, and lecithin.

By most accounts, and especially by those manufacturing and selling it, soy is a wonder food. While studies are ongoing, the evidence so far is controversial at best and sometimes contradictory. To date, consuming large amounts of the hundreds of soy products on the market has not conclusively been proven to improve health or prevent disease.

The powerful, hormonelike soy substances that researchers are examining as possible disease deterrents may be dangerous for the same reason they may be helpful. Isoflavones are thought to block estrogen cell receptors and thus prevent cancer. However, these estrogen-like substances may also stimulate estrogen receptors, which could lead to a host of hormonal problems, including the proliferation of cancer cells. So does soy help or hinder those concerned with cancer prevention? As yet, no one knows for certain.

As with any food, soy is best eaten in a high-quality form. Stick to organic fermented soy products such as miso, tempeh, and tamari sauce. Fermented soy foods, such as miso and tempeh, are rich sources of vitamin B12. Soybeans can also be sprouted and used in Asian food dishes.

2.6.3 Fruits and berries

Fresh fruits and berries are a delight to the taste buds and a rich source of vitamins, minerals, enzymes, fibre, vitamin C, and beta carotene. Local, fresh, seasonal fruits are the ideal choice.

Fruits, especially apples and berries, provide the valuable water-soluble fibre pectin and other fibres, such as cellulose, that keep intestines working properly. The white inner peels of citrus contain bioflavonoids, which help the body absorb vitamin C.

The vibrant colors of berries are a clue to their health-protecting properties. The deep red-, blue-, and purple-colored compounds in berries are phytochemicals called anthocyanins. These are the compounds that have been studied for their ability to reduce the risk of cancer, heart disease, diabetes, and high blood pressure.

It's difficult to isolate the health-promoting elements of berries - eating them whole provides a synergistic symphony of health benefits derived from the natural presence of vitamins, minerals, antioxidants, and phytochemicals.

2.6.4 Whole grains

Hearty grains have been the basis of the human diet for thousands of years. The word "meal" literally means ground grain. Grains are an excellent source of trace minerals, fibre, unsaturated fatty acids, lecithin, B-complex vitamins, vitamin E, and complex carbohydrates. Whole grains contain complex carbohydrates that are broken down during digestion and converted to glucose, the substance the body prefers to burn for energy.

Complex carbohydrates are much healthier than refined sugars (simple carbohydrates) as they are digested more slowly and provide a sustained supply of energy.

Grains cannot be eaten without preparation. They need to be soaked, sprouted. Or cooked to be digestible. Most whole grains, such as brown rice, are prepared by soaking in water for at least seven hours. Simply soak the rice in the water that you will cook it in. The ratio of grain to water is usually one-part grain to two parts water. Bring to a boil and reduce the heat to the lowest temperature; cover with a tight-fitting lid and let simmer for 45 minutes to one hour. Serve immediately or use the cooked rice in casseroles, soups, or rice pudding.

Store grains in clean, tightly closed containers in dry, cool place. Whole wheat kernels, spelt, kamut, and buckwheat have thick outer layers and store for many years under dry, cool conditions. Rice can be stored for about two years. Millet has a very thin outer layer and will go rancid more quickly. A few whole bay leaves inserted into your grain container will act as a natural deterrent to worms.

Grains can be eaten in the form of pasta, cereals, or bread. Commercially prepared dried pasta is usually made from processed white flour, so be sure to buy whole grain varieties. Often a vegetable such as spinach or carrot is mixed with the grain for added and flavor.

Choose cereals that are rolled, milled, or cracked whole grains. A healthy breakfast cereal is muesli, made from soaked rolled oats and fresh fruit and nuts.

Whole grain breads can be made from a variety of grains. Avoid "fortified" white bread, which contains little nutritive value due to processing, and which is further damaged by the addition of preservatives and bleaching agents.

For those who are sensitive or allergic to gluten—a common protein in grains that provides elasticity—there are many delicious alternatives including millet, rice, corn, buckwheat, teff, amaranth, and quinoa. The following grains contain gluten: wheat, barley, oats, spelt, and rye. Those who sensitive to wheat, but not gluten, will probably find spelt flour the best alternative for baking. It can be used in the same way in equal quantities as regular wheat and processed flours.

2.6.5 Nuts and seeds

Nuts and seeds have a higher content of complete protein than all other plants, with the exception of the soybean.

Nuts have a high mineral content. They are good sources of calcium, magnesium, phosphorus, and potassium. Nuts are rich in the B vitamins, especially niacin and biotin, and also contain vitamin E.

Raw nuts and seeds are the best dietary sources of the essential fatty acids omega-3 and omega-6. While commercially packaged nuts tend to be highly salted and seasoned, the natural sodium content of unsalted nuts is very low.

Unrefined, cold-pressed nut and seed oils are a concentrated source of essential fatty acids. They contain these healthy fats in varying proportions, usually with more omega-6 than omega-3. An exception is flaxseed oil, which contains more omega-3. For this reason, using ground flaxseeds daily on salads, and in any dishes that do not require heating to high temperatures, adds valuable elements to your diet.

Note: Check for allergies before giving any nuts or seeds to children or adults

2.6.6. Animal products

When considering animal products, those from organically raised animals are the best option.

Eggs

Organic eggs from free-range chickens are a balanced food. They contain cholesterol, but this is emulsified by the lecithin that also naturally occurs. Lecithin enables fats, including cholesterol, to be dispersed in water and eliminated from the body.

Eggs are an excellent source of protein, sulphur, iron, and vitamin A, and provide a valuable source of vitamin B12 for people who do not eat meat. In addition, eggs contain choline, vitamin B1, vitamin B2, tryptophan (which is converted into vitamin B3), biotin folate, pantothenic acid, selenium, zinc, phosphorus, magnesium, and calcium.

Eggs from free-range free-range chickens have bright yellow-orange yolks, thick, strong shells, and a better flavor than commercial eggs produced on factory farms. In addition, the eggs from caged chickens contain much lower levels of the beneficial omega-3 and omega-6 essential fatty acids than is found in the eggs of their free-range counterparts.

Meat, fish, and poultry

Before the absent of industrialized meat production, animals grazed and ate nutritious natural diets. The meat from these healthy animals provided an important source of complete protein, B vitamins, phosphorus, iron, sulphur, potassium, copper, and essential fatty acids. Animals raised on today's factory farms are fed a diet of grains rather than greens, and suffer from a lack of exercise. These factors have led to an increase in the composition of unhealthy fats in the meat.

The antibiotics routinely administered to cows, pigs, lambs, and chickens compromise the quality of meat and lower the consumer's resistance to diseases. Growth-stimulating hormone injected into animals disturb human hormonal systems. Factory-farmed animals may also be sprayed with insecticides and given oral larvivides.

Organically raised meat from grass-fed animals is available and is the healthiest source if you choose to eat meat. Buy chickens fed a natural diet without the use of antibiotics and growth hormone. Wild fish, especially salmon, sardines, mackerel, and albacore tuna, are among the richest sources of the essential fatty acid derivatives that protect against heart disease, cancer, and inflammatory diseases.

Farmed salmon, on the other hand, has been shown as less nutritious in many ways, including having fewer essential fatty acids when compared to wild fish. A farmed salmon has been raised in net cages; fish farm waste is released directly into the ocean with no treatment, polluting and smothering the sea life below the cages. Disease and parasites are common in farmed fish, so antibiotics are added to the fish feed and passed along the food chain to us. A groundbreaking study found that contaminants and carcinogens such as PCBs, dioxins, dieldrin, and toxophore were consistently and significantly more concentrated in the farmed salmon as a group than in the wild salmon (Ronald A. Hites, et al., "Global assessment of organic contaminants in farmed salmon," Science vol. 303; 9 January 2004:226-229).

Milk and dairy products

Once touted as an absolutely integral part of the human diet, the health benefits of milk and milk products have come under fire. The hormones and antibiotics used in the production of milk are cause for concern. Milk contains many of the same unhealthy fats and additives as red meat, including antibiotics given to cows and the toxic pesticides used on their feed.

However, milk is rich in B vitamins. It also contains vitamins A and D, potassium, calcium, phosphorus, sodium, and traces of zinc. Commercially produced milk products have been pasteurized, homogenized, and supplemented with synthetic vitamin D. Organically produced milk and milk products are the safest and healthiest sources.

A number of people have difficulty digesting milk. The best sources of easily digestible milk products are those that are cultured or fermented such as natural yogurt and kefir. These products have been partly predigested by friendly bacteria, so they are well tolerated even by people who do not have a sufficient amount of the milk-digesting enzyme lactase in their intestines. These foods also help maintain healthy bacterial flora in the intestines.

Butter is a source of saturated fat best eaten in moderation. Buy organic, unsalted butter as it is often fresher and lower in sodium. Make sure no artificial color has been added. Organic butter is the best choice as it does not contain the hormones and pesticides commonly found in commercial daily products.

2.6.7 Fermented foods

Used as a means of food preservation for centuries, fermented foods also have a history as medicine and are now being studied to determine their role in improving conditions such as arthritis, ulcers, colds, digestive disorders, and even cancer.

The bacterial culture in fermented foods is a growth of live bacteria. Over the years, bacteria have earned a bad reputation because they are usually associated with disease. However, without bacteria the body would cease to function properly. Friendly intestinal bacteria exist in the digestive tract to maintain healthy intestinal flora necessary for the proper digestion and assimilation of food. Healthy intestinal flora also prevents the growth of undesirable micro-organisms, including candid yeast overgrowth and bacteria that cause disease. The bacteria that support and enhance life are called probiotics.

Lactic acid and enzymes are produced during the fermentation process and appear to have a beneficial effect on the digestive system and metabolism. Because of the process of fermentation, these foods are considered predigested, making them easy to digest and assimilate.

Fermented foods include yogurt, kefir, pickled vegetables (such as sauerkraut, cucumbers, and beets), miso, tempeh, and traditionally made sourdough breads (those made with a culture starter).

Yogurt

When buying yogurt, look for the words “active” or “live” in reference to the culture. Some yogurt is pasteurized after it is made, killing its healthy bacteria. In yogurt with active culture, the milk is pasteurized before bacterial culture is added. Commonly used yogurt cultures are the friendly bacteria *Lactobacillus bulgaricus* and *Lactobacillus acidophilus*. These cultures boost the body’s own friendly bacteria, thereby improving digestion and keeping the intestines healthy.

Kefir

Another fermented-milk product, kefir originated in the northern part of the Caucasus Mountains, between the Black and Caspian seas, an area once known for its healthy and long-

lived people. Kefir is less firm than yogurt and is usually taken as a drink. It is a great option for lactose- intolerant people and works as a probiotic in the intestinal tract. While yogurt culture loses its potency over time, kefir is a hardy culture that is self-generating, which means it can be kept going indefinitely.

Sauerkraut

This fermented cabbage dish is believed by some natural health experts to be a traditional natural remedy for cancer. The results of recent research showed that cancer-preventing compounds, known as isothiocyanates, are found in cruciferous vegetables, including fermented cabbage (Tolonen, M., et al. "Plant-derived biomolecules in fermented cabbage." *Journal of Agricultural and Food Chemistry*, 2002 November 6;50(23):6798-803). Further research is needed to determine if consuming sauerkraut has a cancer-preventive effect on humans. However, sauerkraut is rich in many nutrients, including vitamin C and beneficial lactic acid bacteria. The lactic acid fermentation makes the cabbage easy to digest.

Miso

Made from fermented soybeans and/or barley, miso comes in the form of a paste to be used in soups, dressings, and sauces. Originating in Japan, this seasoning ingredient provides a salty, flavorful taste to dishes, along with some protein and complex carbohydrates. As with yogurt and sauerkraut, miso provides a wealth of healthy micro-organisms to maintain and promote intestinal health. Be careful not to heat this food to a boiling point, as the live culture will be destroyed.

The different types of miso offer different colors and flavors. Typically, the longer the soybeans are fermented, the darker the miso paste will be.

2.7 Foods to Avoid

Stopping unhealthy eating behaviors is one of the cornerstones of natural health. Avoiding heavily processed, packaged, colored, and otherwise adulterated foods is essential to healthy eating.

For many people this approach to diet requires the development of a whole new way of thinking about food. To assist in the transition, here is a list of processed foods you may wish to avoid:

- cured meats, sausages, luncheon meats, hot dogs
- soda pop and artificial fruit-flavored beverages
- ice cream and frozen desserts
- many commercial breakfast cereals
- many commercial breads and packaged baked goods

- processed cheese products
- margarine, lard, shortening
- fried fast foods
- candy

2.7.1 Food additives

The use of food additives can probably be traced back to early civilization when it was discovered that adding salt to meat slowed spoilage. By the 1950s food manufacturers were adding hundreds of emulsifiers, thickeners, stabilizers, dyes, conditioners, flavorings, and preservatives to their products.

While canned, instant, frozen, and processed foods such as TV dinners, hot dogs, cake mixes, cookies, and breakfast cereals may initially seem like great time and energy savers, there is a high price to pay for this convenience. Processed and adulterated foods are more costly than whole foods when you take into account their low nutritional value and high health risk, compared to a diet built upon whole foods. Some of the food industry's most potentially toxic substances are added to alter a food's color, consistency, or appearance.

In the US, it was not until 1958 that food and chemical companies were required to test food additives for safety. Previously, the onus was on the concerned individual or group to prove the danger of suspect additives. Subsequent to the 1958 food additive testing laws came the GRAS (Generally Recognized As Safe) list. This was a list of additives that had been widely used before 1958 that were granted exemption from the testing that would be required of newly developed food additives. Unfortunately, additives with GRAS status are used liberally, even indiscriminately, although many have been recalled over the years and others still raise health and safety questions from concerned doctors, scientists, and health advocates. You may wish to avoid the following common food additives:

- acacia gum (gum Arabic)
- alginic acid
- aspartame
- benzoic acid
- brominated vegetable oil (BVO)
- BHA and BHT (preservative)
- citrus red dye #2
- monosodium glutamate (MSG)
- nitrites

- propyl gallate
- saccharin
- sulphur dioxide, bisulphate, and sulphites
- yellow dye #6

2.7.2 Genetically modified organisms (GMOs)

Genetically modified organisms are life forms that have been modified through genetic engineering (GE) to produce a desired result. In the 20 years, scientists in the field of biotechnology have been using genetic engineering techniques to improve crop production. Usually the desired gene (information from DNA, sometimes referred to as the blueprint of life) is injected into receiving cells, bombarding, and permanently altering the cells' natural DNA. The result is a genetically modified organism, or GMO.

The most common genetically engineered ingredients used in common food production are canola, corn, soy, potatoes, flax, and tomatoes. More than 105 million acres of GM crops were planted in the United States as of 2003. As of 2004, more than 80 percent of the soybeans and corn and 54 percent of all canola grown in the US were genetically modified. The US has planted more GM crops than any other country, and Canada is the world's third-largest producer (The Pew initiative on Food and Biotechnology. "Genetically modified crops in the United States." August 2004). Corn, canola oil, and soy are common ingredients in many processed and packaged foods. Simply put, we are eating food that has been genetically altered. What will it do to us? What will it do to our children, or our unborn children? No one knows.

Genetic engineering is not the same as crossbreeding, which farmers have used for thousands of years to improve food crops. For instance, crossbreeding mixes the pollen of tasty potato species with that of a hardy potato variety, producing new varieties that are both tasty and hardy. The dramatic difference between the ancient plant-breeding methods and genetic engineering is that cross-pollination works within the same species (e.g., potato plants). With genetic engineering, the DNA of any species can be injected into that of another. Fish genes can be injected into tomato cells or bacterial toxins can be injected into potato genes.

GMO ingredients are found in the majority of processed foods in all their forms, including corn oil, corn syrup, and cornmeal, for example. Cereals, crackers, soups, and candy are all potential sources of GMOs.

Fortunately, whole foods that are certified organic are free from engineering.

2.7.3 Pesticides and antibiotics

Many of us think of the environment something we need to preserve for aesthetic purposes only. We often think the environment is something "out there," in nature. The truth is, we are inextricably linked to our environment, and health determines our own in many ways.

Pesticides

Most commercial farmers grow mass amounts of one type of food (corn, wheat, cotton) for profit, without care for the soil or ecology. Monocropping (planting the same crops on the same land year after year) is a common practice that strips the soil of nutrients, causing an ecological imbalance that must be compensated for with synthetic chemical fertilizers.

Agricultural chemicals, used regularly on factory farms, have become the focus of a booming business.

Worldwide sales of pesticides—which include insecticides, nematocides, rodenticides, fungicides, and herbicides, among others—totaled more than \$ 32 billion US in 2004 (Barbara Dinham, “Agrochemical markets soar –pest pressures or corporate design? “Pesticides News no. 68, Jun 2005:9-11). For the year 2000-2001 the US Environmental protection Agency reported that more than five billion pounds of these toxic chemicals were used on our agricultural lands (US Environmental Protection Agency, “2000-2001 Pesticide market estimates: usage,” 2001).

Insects breed rapidly and quickly develop resistance to insecticides, leading to persistent use of chemical-based pest repellents, which, in turn, keeps the pesticide

Industry profitable and prosperous. Unfortunately, broad-spectrum pesticides also kill natural predators that keep pests in check and destroy the micro-organisms and worms in the topsoil.

Healthy topsoil is alive. Part of its life, as well as its structure, comes from the micro-organisms, insects, and worms, as well as from the byproducts they produce.

Pesticide runoff can contaminate drinking water supplies. Many of the chemicals found in pesticides have been linked to cancer and genetic, nerve, and brain damage. Recent studies (for example, Dick, F.D., et al, “Environmental risk factors for Parkinson’s disease and parkinsonism: the Geoparkinson study.” Occupational and Environmental Medicine 2007 Mar 1; [Epub ahead of print]), show that agricultural pesticides play a causal role in Parkinson’s disease. DDT (dichlorodiphenyltrichloroethane), one of the deadliest insecticides ever used, has contaminated the entire food chain. Despite a ban in the late 1960s, DDT remains a part of our environment today because it cannot be broken down by normal environmental processes.

Industrial agribusiness is damaging our environment, food, and health. A landmark 1991 United Nations study estimated that 552 million hectares—equal to 38 percent of today’s global cultivated area—had been damaged to some degree by agricultural mismanagement since World War II (cited in Brown, Lester R. State of the World 1997. Washington, DC: Worldwatch Institute, 1997).

Sustainable agricultural practices, including organic farming, are better for the health of the planet, the farmers, and the consumers.

Antibiotics

Antibiotic-resistant bacteria are on the rise, placing humans at risk. Patients once effectively treated for pneumonia, tuberculosis, and ear and skin infections may now have to try three or more antibiotics before finding one that works, if they can find one at all. Overuse of antibiotics is the reason for this; we have facilitated the development of superbugs, mutated over time to be resistant to available drugs. Physicians and hospitals have overprescribed antibiotics, and patients have demanded them, even for illnesses not caused by bacteria.

But another major cause of antibiotic resistance is the massive use of antibiotics by the factory farm industry to promote animal growth, curtail disease, and ensure higher profits. Produce growers are also guilty of spraying antibiotics freely on crops to control bacteria that damage vegetables and kill trees.

There is no way for consumers to know if the meats and animal products they buy have been treated with antibiotics unless they have been labeled “antibiotic-free” or “organic.” Farmers are not required to report antibiotic use in animals, and the huge factory farms are fighting any ban on the use of antibiotics in their operations, saying they cannot keep animals in crowded spaces without using pharmaceuticals.

2.7.4 Irradiated food

Food that has been irradiated has been subjected to any form of radiation. Food irradiation has been regulated under the Canadian Food and Drugs Act (R.S., 1985, c. F-27) for more than three decades. Until 1989 irradiation was considered a food additive, but is now recognized as a process. Food manufacturers and agricultural businesses are permitted to irradiate potatoes and onions to inhibit sprouting wheat flour to control insects, and whole ground spices and dehydrated seasonings to reduce microbial content.

Health Canada claims the process of irradiation improves the safety of food by reducing levels of pathogens associated with food-borne disease; reduces microbiological growth causing spoilage, thereby extending shelf life; reduces insect infestation; and delays ripening of fruit and vegetables (“Proposed amendments to the Food and Drug Regulations regarding food irradiation in Canada,” November 2002).

Some health advocates, however, suggest irradiated foods are less nutritious than fresh foods as radiation damages some vitamins, amino acids, and fatty acids. In addition, there have been no studies, to date, to determine the consequences of irradiating the pesticide residues commonly found in foods. Irradiation may also be responsible for some cases of poisoning, since treated foods may be contaminated but appear fresh.

Micro-organisms that normally cause meat to look or smell spoiled may be killed by irradiation, yet heartier bacteria, such as the one responsible for botulism food poisoning, may survive.

While the Canadian Food Inspection Agency requires that entirely irradiated foods are labeled with the international radula symbol, when it comes to processed foods, only those irradiated ingredients that comprise 10 percent or more of the finished product need to be listed. A food

product with more than one irradiated ingredient, therefore, will not be listed as irradiated at all if each irradiated ingredient slips in under the 10 percent mark.

In the US, the Food and Drug Administration says food irradiation is a safe and effective way to kill harmful bacteria and reduce food-borne health hazards, although it admits the process may cause “a small loss of nutrients.” US federal law requires irradiated foods to be labeled as such and display the radura symbol (“Food irradiation: A safe measure.” US Food and Drug Administration, 2000).

2.8 Detoxification and Cleansing

One of the body’s natural means of staying healthy is its ability to detoxify itself. This ability has never been so important as the world becomes a virtual cesspool of contaminants that adversely affect our health.

Many of the harmful substances we absorb, inhale, or create are rendered harmless and expelled from the body. The organs of detoxification are the liver, kidneys, bowels, lungs, and skin. Avoiding harmful substances such as junk food, drugs, and smoke, as well as supporting the organs in their detoxifying action, is vital in maintaining and restoring health.

Sufficient fluid intake supports the eliminating function of the kidneys, the bowels, and the skin. We often forget the skin’s function as a detoxifying organ, and yet many therapies rely on this ability, including saunas, which promote sweating. Fever is a natural means of toxin elimination during sickness. The heat triggers chemical reactions that enhance the immune system and destroy bacteria and viruses.

Healthy circulatory and lymphatic system support detoxification. When these become sluggish, waste products can be left behind the tissues. Alternating hot and cold baths have been known to invigorate both the circulatory and lymphatic systems. Dry brushing the skin is a European method of improving skin function. Besides serving to cleanse the skin of dead cells, it also promotes circulation and stimulates circulation and stimulates detoxification.

Fasting is one method of detoxification and purification. It can also be an inspiring and motivating experience. An ancient tradition, fasting has been used for religious and spiritual purposes to cleanse and strengthen the body and spirit. Although it is not appropriate for everyone, fasting is an effective way of moving toward a healthier diet and removing unhealthy attachments to food, drugs, and alcohol.

For those of us whose lifestyles do not allow for fasting, an ongoing effort to cleanse the body can improve our health.

Daily cleansing tips

Upon rising each morning, drink a glass of water with the juice of a fresh lemon squeezed in it.

Eat only fruit mid-morning.

Eat small, frequent meals.

Do not eat past 7 pm so your body can fast for 12 to 14 hours overnight, allowing rest and repair of its systems.

Get fresh air and exercise daily.

Exercise to a sweat at least three times each week for a minimum of 20 minutes each time.

Use natural soap and cosmetic products on skin and hair.

Drink at least eight glasses of water, between meals, daily.

Clear the mind of clutter with at least 10 minutes of quiet stillness each day.



D-Mannose with Cranberry

Quest D-Mannose is a naturally occurring simple sugar that can help to prevent and treat recurrent urinary tract infections (UTIs). This exclusive formula is recommended for people who experience frequent UTIs as an effective alternative to antibiotic treatment that won't disrupt normal intestinal microflora.



PRODUCTS CODES:

338184

HEALTH SOLUTIONS:

RECOMMENDED USE	DOSAGE FORM	RECOMMENDATIONS
Helps to prevent recurrent urinary tract infections.	Vegetarian Capsules	Adults take 2 capsules daily. Use for a minimum of four weeks to see beneficial effects.

DESCRIPTION:

Each easy-to-swallow capsule of Quest D-Mannose contains 300 mg of D-Mannose (from Beech wood and Birch wood) and 200 mg Cranberry (*Vaccinium macrocarpon*) dried fruit juice.

This product contains no artificial preservatives, colours, or flavours, corn, dairy, egg, gluten, shellfish, soy, sulfites or animal derivatives.

Recommended Daily Allowance:

N/A

Food Sources:

N/A

Causes of Deficiency:

E. coli bacteria.

Symptoms of Deficiency:

Urinary tract infections.

Complementary Nutrients: Adequate intake of water.

HOW IT WORKS:

D-mannose is a naturally occurring simple sugar that has a structure similar to that of glucose. Only a small amount of D-mannose can be metabolized; any excess is excreted from the body via urine. *Escherichia coli*, the most common UTI-causing bacteria, produces chemicals that enable the organism to cling to epithelial cells where they proliferate and cause infection. When taken in large quantities, excess D-mannose that spills into the urine adheres to any *E. coli* that is present in the urinary tract, dislodging the bacteria from the cells that line the urinary tract walls and excreting them with normal urination.



DID YOU KNOW...

Because the body metabolizes only small amounts of D-mannose and excretes the rest in the urine, it less likely interfere with blood-sugar regulation, even in diabetics.

RESEARCH:

Studies suggest that D-mannose is 10 times more effective than cranberries in dislodging *E. coli* bacteria from the urinary tract and bladder walls, and, as such, can ameliorate more than 90% of UTIs in 24 to 48 hours.

SIDE EFFECTS:

No side effects expected at recommended dosage.

INTERACTIONS AND SAFETY CONSIDERATIONS:

None known.

OTHER CONSIDERATIONS:

Consult a health care practitioner if you are pregnant or breastfeeding. Keep out of reach of children. D-mannose with cranberry should not be used as a substitute for antibiotic treatment of urinary tract infections; however, it can be used as an adjunct therapy.

LABEL:

QUEST PRÉVENTION D-Mannose avec canneberge  NPN 80024767 Aide à prévenir les infections récurrentes des voies urinaires 60 capsules végétales	Usage recommandé: Aide à prévenir les infections récurrentes des voies urinaires. Dose recommandée (adultes): Prendre 2 capsules par jour. Utiliser pendant au moins quatre semaines afin de pouvoir constater les effets bénéfiques. Ingrédients médicinaux: Chaque capsule contient: D-mannose (provenant du bouleau et du hêtre).....300 mg Canneberge (<i>Vaccinium macrocarpon</i>) jus de fruit déshydraté.....200 mg Ingrédients non médicinaux: Cellulose, stéarate de magnésium, dioxyde d'aluminium, phosphate de calcium tribasique, maltodextrine, hydroxyde de magnésium, hypromellose. Risk Information: Consultez un praticien des soins de santé avant d'en faire usage si vous êtes enceinte ou allaitante, si vous prenez des anticoagulants ou si vous avez déjà souffert de calculs rénaux. Consultez un praticien des soins de santé si les symptômes persistent ou s'aggravent. Ce produit ne contient pas d'ingrédients laitiers, oeuf, gluten, crustacés, soja, sulfites, ni dérivés d'origine animale. SUPERIEUR EN QUALITÉ ASSURÉE RANGER DANS UN ENDROIT SEC ET FRAIS. TENIR HORS DE PORTÉE DES ENFANTS.
QUEST PREVENTATIVE D-Mannose with Cranberry  NPN 80024767 Helps prevent recurrent urinary tract infections 60 vegetable capsules	Recommended Use: Helps to prevent recurrent urinary tract infections. Recommended dose (Adults): Take 2 capsules daily. Use for a minimum of four weeks to see beneficial effects. Medicinal Ingredients: Each capsule contains: D-Mannose (from Beech wood and Birch Wood)300 mg Cranberry (<i>Vaccinium macrocarpon</i>) dried fruit juice200 mg Non-medical Ingredients: Cellulose, magnesium stearate, aluminum dioxide, calcium phosphate tribasic, maltodextrin, magnesium hydroxide, hypromellose. Risk Information: Consult a health care practitioner prior to use if you are pregnant or breastfeeding, taking blood thinners or have a history of kidney stones. Consult a health care practitioner if symptoms persist or worsen. This product does not contain dairy, eggs, gluten, shellfish, soy, sulfites or animal derivatives. TREMPERED IN PREMIUM QUALITY ASSURED STORE IN A COOL, DRY PLACE. KEEP OUT OF REACH OF CHILDREN.

RX BALANCE® The Quest for Health® with knowledge

Education with Excellence

Module 2: Nutrition

quiz

1. Humans need many nutrients daily to function properly. Which of the following are macronutrients?
 - a. carbohydrates, fats, and proteins
 - b. proteins, vitamins, and minerals
 - c. water, fats, and enzymes
 - d. all of the above
 - e. a and c only
2. The body is composed of _____ percent water.
 - a. 90
 - b. 60
 - c. 70
 - d. 80
 - e. none of the above
3. Grains have been the basis of the human diet for many years. They:
 - a. are an excellent source of fibre.
 - b. cannot be eaten without preparation.
 - c. Contain trace minerals.
 - d. All of the above
 - e. a and c only
4. Each vegetable capsule of Quest® D-Mannose with Cranberry provides _____ milligrams of D-mannose?
 - a. 200
 - b. 250
 - c. 300
 - d. 400
 - e. 500
5. Carbohydrates are the body's main source of fuel. True or false?
6. Egg are excellent source of protein, sulphur, iron, and vitamin A, and they provide a valuable source of vitamin B12 for people who do not eat meat. True or false?

7. Quest® D-Mannose with Cranberry may assist in averting recurrent urinary tract infections by helping to dislodge *E. Coli* from the urinary tract wall. True or false?
8. Quest® D-Mannose with Cranberry can be used as a substitute for antibiotic treatment of urinary tract infections. True or false?
9. Nuts and seeds have the highest complete protein content of all plant sources. True or false?
10. Fermented foods include kefir, sauerkraut, and cabbage. True or false?