



THE MESCHINO

**OPTIMAL
LIVING
PROGRAM**

**SEVEN STEPS TO
A HEALTHY, FIT,
AGE-RESISTANT
BODY**

SECOND EDITION

DR. JAMES MESCHINO

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Dr. James Meschino

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Introduction

Welcome to *The Meschino Optimal Living Program*. The system described in these pages is the culmination of 25 years of personal research and clinical experience. Its purpose is to provide you with a proven, life-long strategy for maintaining your ideal weight, enhancing your fitness and energy levels, improving your cardiovascular health, and reducing your risk of degenerative and age-related diseases. Easy to follow and highly effective, this nutrition, exercise and supplementation program equips you with both the knowledge and the plan of action to achieve the healthy, well-functioning body that nature intended.

Modern research has long established that proper eating habits, regular exercise, and the right nutritional supplements can slow or reverse many aspects of the aging process. The benefits are legion: the maintenance of immune function, bone density, cognitive ability, and sexual virility; a radiant appearance, increased energy, and a sense of well-being; the prevention or postponement of the most common diseases that plague the western world; a longer, more productive and rewarding life.

I wrote this book with one truth in mind: the simple daily effort required to optimize the health of your body is well within your ability, your means, and your timetable. And isn't good health worth that effort? If you become sick or disabled, the goals you have set for yourself will almost certainly become more difficult to

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achieve and the social, recreational and athletic activities you enjoy less pleasurable, perhaps even impossible.

For more than two decades, I have taught the principles of this program to healthcare professionals throughout Canada and the United States and have incorporated them into wellness initiatives for numerous corporations. I have seen excellent clinical results among the patients treated in my own nutritional consulting practice. Unfortunately, many North Americans either do not realize the benefits of this combined approach to nutrition, exercise and supplementation, or they are willing to live with the consequences of ignoring the basic laws of healthy living.

We are currently experiencing an epidemic of degenerative diseases, many of which are preventable or can be greatly reduced in severity, according to top experts from around the world. For example, data published in the Journal of the National Cancer Institute in 1996 by Dr. Walter Willet of Harvard University indicated that between 70 and 90% of all cancers could be avoided through more prudent dietary and lifestyle behaviors. It is well accepted within the medical community that vascular disease leading to heart attack and stroke, the leading killers in our society, is primarily caused by poor eating and lifestyle habits. The same is true for the alarming increases in the incidence of Type 2 diabetes and osteoporosis. Furthermore, there is evidence that deficiencies of certain nutrients are behind many cases of cataracts and macular degeneration of the eye, as well the development of age-related dementia and cognitive decline.

These facts illustrate that in the majority of cases, the serious health afflictions we fear are not the fault of our genes but rather the way we choose to live our lives. And that means there is something you can do about it: choose the right foods, commit to the right exercise program and add the right supplements to your diet, and you will significantly reduce your risk of these afflictions and dramatically slow the effects of aging.

Introduction

In the pages that follow, I'll introduce you to the Two Staple Nutrition System, a plan that ensures that you'll eat the foods your body needs to be healthy, lean and disease-resistant. I'll show you how to incorporate an appropriate and personalized exercise program into your life. Plus, I'll explain precisely what nutritional supplement combinations you should take every day and at every stage of your life to counter aging and protect against disease. Scientists tell us that with proper attention to diet, exercise, specific supplements and other lifestyle measures, we have the potential to live at least 120 years and to enjoy a high quality of life throughout this lifespan. *The Meschino Optimal Living Program* explains the science on which these statements are based and shows you how to translate science and clinical knowledge into a practical, daily program that is accessible and available to everyone who truly cares about their health and wellness.

STEP I

Build Your Nutrition Foundation

The first step in building a lifestyle program for a healthy, fit, age-resistant body is to understand how various nutrients work in your body. Nutrients can either promote your health and prevent disease, or detract from your health and encourage the development of degenerative diseases leading to premature death. Understand how various nutrients affect your health, and you can visualize what happens inside your body every time you consume carbohydrate foods, high-protein foods, saturated fat, cholesterol, omega-3 fats, monounsaturated fats, and other nutrients. *So let's spend some time examining how your body processes the foods you eat.*

Carbohydrates

Thanks to the recent high-protein, low-carbohydrate diet craze, there is a great deal of confusion about carbohydrate foods. Do they promote health, delay aging, and prevent disease? What is their role in weight loss?

The first thing to appreciate is that many carbohydrate foods are provided to us by the good earth: fruits and vegetables; grains (such as rice); cereal products (for example, wheat); and legumes, including beans and peas. Naturally-occurring carbohydrates can be manipulated by food processing to make the modified carbohydrates that are found in breads, breakfast cereals, pasta, crackers, jams and

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jellies, and sugar. Although the different carbohydrates we consume vary in terms of their health-promoting features, all carbohydrate foods, including white sugar, have one thing in common: they all provide the building blocks from which your body makes glucose. Glucose is the simple sugar molecule that serves as an essential energy source for virtually every cell in the body. If your blood sugar level drops, meaning the level of glucose in the blood is abnormally low, then the cells can no longer function at their best. This is why you are likely to feel shaky, light-headed, irritable, and unable to concentrate, if you go past your usual mealtime without eating. These symptoms are a direct result of low blood glucose levels.

Your body digests carbohydrate foods and produces glucose for energy in a highly efficient way. After ingestion, your digestive enzymes go to work to release the individual sugars in these foods, allowing them to pass into the bloodstream. Once in the bloodstream, carbohydrate sugars travel to the liver where they are converted into glucose by the action of specific liver enzymes. The glucose is returned to the bloodstream, where it becomes a continuous source of energy for the body's cells. It doesn't matter if you eat a potato, a bowl of rice, a plate of pasta, a piece of fruit, or a salad—the carbohydrates in these foods will all be converted into glucose, which will help power most of the body's cells. Some of the glucose will be used immediately and some stored in the liver for future use. Between meals, the liver releases this stored glucose, called glycogen, to the bloodstream to meet the energy demands of your body.

If you fail to consume adequate amounts of carbohydrate foods and deprive your cells of energy, you may develop the condition known as hypoglycemia, which means “low blood sugar.” Hypoglycemia affects the brain and nervous system quite dramatically, because brain cells and other nerves rely on glucose for up to 95 percent of their energy needs. As described earlier, the symptoms of hypoglycemia include fatigue, irritability, nervousness, a dull

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headache, and so forth. Thus it is imperative to maintain blood glucose levels by consuming the right amount of carbohydrates each day.

Of course some carbohydrate foods are better for you than others. Not only do they provide carbohydrate energy, they may also contain protective nutrients that help defend us against cancer and heart disease. Remember that some carbohydrate foods release their sugars faster than others and are therefore absorbed more rapidly into the bloodstream. Carbohydrate foods that are absorbed too quickly are more likely to be converted into fat and triglycerides within the body and can also produce a sugar rush, from too sudden a rise in blood sugar. This can result in weight gain, a rebound drop in blood sugar (hypoglycemia) or an increase in the risk of developing diabetes. Athletes may want to consume carbohydrates that are absorbed quickly into the bloodstream, as doing so can enhance performance in many endurance events. But day to day, most of your carbohydrates should come from carbohydrate foods that are absorbed more slowly from the intestinal tract and that contain the protective nutrients that reduce the risk of cancer, heart disease, and other degenerative diseases.

The Right Amount and Right Type of Carbohydrate Foods

Your body requires sufficient carbohydrate energy each day to sustain its peak functional state, but that's not to say that you can eat unlimited carbohydrate calories without consequences. Overconsuming carbohydrate calories will increase your body fat and your blood triglyceride levels, those fats found in the blood that are associated with heart disease risk. However, avoiding carbohydrate foods is an equally critical mistake that many carbohydrate-phobic dieters are making these days. The key is to consume the right amount and right type of carbohydrate foods,

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appropriate to your lifestyle and activity level. Used wisely, carbohydrate foods will elevate your energy level, boost your defenses against disease, help you attain and maintain your ideal body weight without feeling deprived, and improve your performance in most exercise and athletic endeavors. Depending on your level of physical activity, carbohydrate foods should make up 45 to 65 percent of your total calories. The more active you are, the greater the requirement for carbohydrate consumption. If you are more sedentary, then you cannot consume the same quantity or percentage of carbohydrate calories as a highly active person without experiencing weight gain and other health problems.

Over the years nutritionists and dieticians have told us that there are two types of carbohydrates to be aware of: complex carbohydrates and simple carbohydrates, sometimes referred to as low-glycemic and high-glycemic carbohydrate foods, respectively. Yet this approach to carbohydrate identification does not tell the whole story. If you are truly interested in living as long as possible in a healthy, fit, age-resistant body, then you have to understand carbohydrate foods on a more sophisticated level.

I have broken down carbohydrate foods into five categories in order for you to fully understand how carbohydrate choices impact your health. Some categories should be emphasized more than others, but all five have their place in human nutrition and optimal wellness. In order of their beneficial importance to a healthy diet, they are:

- Category 1 – Low-Glycemic, Nutrient-Dense Carbohydrates
- Category 2 – High-Glycemic, Nutrient-Dense Carbohydrates
- Category 3 – High-Fiber Grains and Starchy Carbohydrates
- Category 4 – Low-Fiber Grains and Starchy Carbohydrates
- Category 5 – Refined Sugars

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Category 1—Low-Glycemic, Nutrient-Dense Carbohydrates

These carbohydrate foods:

- slowly release their carbohydrates into the bloodstream from the intestinal tract;
- are low in total calories and do not readily encourage weight gain or blood sugar imbalances;
- are a rich source of vitamins, minerals and other protective nutrients, known as phytonutrients, which help reduce the risk of cancer, heart disease, and other degenerative diseases.

Category 1 carbohydrates are extremely beneficial to the body, and should be a main focus of your daily carbohydrate intake. The choices include asparagus, spinach, broccoli, cauliflower, Brussels sprouts, cabbage, bok choy, rapini, collard greens, turnips, tomatoes, peppers, onions, cantaloupe, granny smith apples, radicchio, romaine lettuce, beans, peas, and lentils. Many of these contain powerful protective nutrients. Try to consume at least three servings of the following carbohydrate foods each day.

Cruciferous Vegetables (broccoli, Brussels sprouts, cabbage, cauliflower, bok choy, turnips)—individuals with high intakes of these vegetables throughout their lifetimes show a significant reduction in the incidence of colon cancer, breast cancer, and prostate cancer. These vegetables contain indole-3-carbinol, which enhances the ability of our detoxification enzymes to neutralize and remove carcinogens from the bloodstream and the cells. Indole-3-carbinol also promotes the conversion of estrone, one of the body's estrogen hormones, into 2-hydroxy-estrone—instead of the potentially harmful 16-hydroxy-estrone, which is associated with an increased risk of breast cancer. Indole-3-carbinol may block the

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synthesis of estrone hormone in fat cells, which is associated with a reduction in risk of breast and prostate cancer. I suggest that you eat cruciferous vegetables every day.

Tomatoes—tomatoes are a rich source of the antioxidant lycopene. Higher intakes of lycopene have been linked to significant reductions in prostate cancer and cervical cancer. Lycopene is a sister compound to beta-carotene and is one of many carotenoids found in fruits and vegetables. It gives tomatoes their red color and red grapefruit its pink tinge. Two extensive U.S. studies, the Health Professionals Follow-Up Study and the Physicians' Health Study, suggest that higher intakes of lycopene, mostly from tomatoes and tomato products (such as pasta sauces) and higher blood levels of lycopene were linked to a lower risk of prostate cancer. Lycopene has been shown to concentrate in the male prostate gland, where it provides antioxidant protection against free radicals—aggressive compounds that randomly attack body tissues—and exhibits other anti-cancer effects. These effects of lycopene are similarly important in the prevention of cervical cancer in women. Lycopene is a fat-soluble nutrient and therefore must be consumed with a bit of fat in order to be absorbed into the bloodstream. Use olive oil in your pasta sauce. Or eat salads that are dressed with olive oil-based dressings. (Drinking tomato juice on an empty stomach or eating tomatoes with no concomitant fat consumption means no lycopene will be absorbed from the intestinal tract into the bloodstream.) A daily serving of tomatoes or tomato-based products is highly recommended.

Spinach, Asparagus and Other Dark Green Leafy Vegetables—these vegetables contain lutein and zeaxanthin, two carotenoids that help prevent macular degeneration, the leading cause of blindness in individuals over the age of 55 in the United States and Canada. Lutein and zeaxanthin concentrate in the back of the eye, near the optic nerve, protecting it against damage by free radicals induced by sunlight. Studies show that a higher lifetime

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intake of lutein and zeaxanthin lowers the risk of macular degeneration and cataracts, and that lutein and zeaxanthin supplements can help slow the progression of macular degeneration, especially when taken along with other antioxidant supplements like vitamin C, vitamin E, selenium, and zinc.

Mostly dark green vegetables also contain beta-carotene and folic acid. Beta-carotene is an important antioxidant that may help reduce cancer risk, and folic acid is required for normal DNA synthesis in every cell in the body. Many individuals in North America who do not take a daily multivitamin and mineral supplement suffer marginal deficiency in folic acid; that makes them more prone to certain colon and breast cancers. In women of child-bearing age, there is increased risk of giving birth to children with spinal birth defects, such as spina bifida. Consuming dark green leafy vegetables—not iceberg lettuce—should also be part of your daily carbohydrate intake strategy.

Beans, Peas and Lentils—these legumes contain lignans and plant-based sterols, which provide many disease-prevention benefits to the body. Lignans help block the overproduction of estrone hormone in fat cells, which in turn is associated with a reduced incidence of breast and prostate cancer. Plant-based sterols, such as beta-sitosterol, are known to block the conversion of testosterone into dihydrotestosterone, an effect that has been linked to the prevention of prostate enlargement and prostate cancer. Plant sterols have also been demonstrated to block the replication of certain breast cancer cells, improve immune function, and help keep blood cholesterol in a safe range by preventing the absorption of cholesterol and bile acids from the intestinal tract into the bloodstream. Furthermore, beans, peas, and lentils contain the kind of fiber that improves bowel function (thereby reducing the risk of colon cancer) and that lowers blood cholesterol (thus helping prevent heart attack and stroke).

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Soybeans and related soy products, like tofu, miso soup, and soy nuts, contain isoflavones, which are strongly associated with a reduced risk of breast and prostate cancer. Since many soy products are high enough in protein to be classified as protein foods, we will examine them at greater length in the protein section of this chapter.

Onions and Garlic—onions and garlic, allium-containing vegetables, have a specialized group of disulfide compounds that exhibit potent anti-cancer, anti-heart disease, and immune-stimulating properties.

Category 2—High-Glycemic, Nutrient-Dense Carbohydrates

These carbohydrates:

- contain a lot of simple sugars that are absorbed quickly into the bloodstream, which can produce a sugar rush or hasten their conversion into fat, if they are consumed in excess; (This is the only negative feature of Category 2 carbohydrates.)
- are a rich source of many protective nutrients—such as carotenes, flavonoids, vitamins, and minerals—which are important in the prevention of cancer, heart disease, and other degenerative diseases;
- are a good source of cholesterol-lowering fiber.

Category 2 carbohydrates are found in all sweet-tasting fruits (oranges, clementines, nectarines, peaches, plums, grapes, pineapple, honeydew melon, watermelon, strawberries, blueberries, cranberries, kiwi, papaya, mango, dates, figs, dried fruits); fruit juices (which should always be diluted at least 50 percent with water); all sweet vegetables (squash, yams, sweet potatoes, carrots, corn, beets); and jams and jellies.

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Factor at least one or two servings of these foods into your daily carbohydrate intake:

Orange-yellow fruits and vegetables—are generally high in beta-carotene and other carotenoids, such as lutein, which provide antioxidant protection to many parts of the body. Studies indicate that people with high intakes of orange-yellow fruits and vegetables and dark green leafy vegetables have a significantly lower incidence of various cancers, heart disease, cataracts, or macular degeneration of the eye. In addition, one-sixth of all the beta-carotene consumed can be converted into vitamin A by your body, if your body requires more. Vitamin A serves many important functions and has also been shown to exhibit anti-cancer properties.

Dark Blue Fruits and Vegetables—the dark blue colour of blueberries, bilberries, and blue-purple grapes is due to the presence of specific flavonoids. These flavonoid compounds provide antioxidant effects; protect the eye from ultraviolet light damage; and can strengthen the blood vessels, helping to prevent ruptures, hemorrhage, and the formation of varicose veins.

Jams, Jellies, Apples, Peaches, Pears, and Plums—these carbohydrate foods are an excellent source of cholesterol-lowering fiber, which helps prevent heart disease and stroke.

Category 3—High-Fiber Grains and Starchy Carbohydrates

These carbohydrates:

- contain a lot of carbohydrate calories per serving. Unless you are exercising regularly at a high level of intensity, over consumption of Category 3 carbohydrates will hasten their conversion to fat and lead to a rise in body fat and triglyceride levels. People who work out regularly and are

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engaged in endurance activities should consume more of these carbohydrates to help replenish their carbohydrate stores on daily basis;

- These kinds of carbohydrates are a very good source of the type of dietary fiber that is associated with reduced risk of colon cancer and improved function of the large bowel. A small daily dosage of Category 3 carbohydrates can provide significant health benefits to the bowels.

Category 3 carbohydrate foods include brown rice, couscous, high-fiber/low-fat breakfast cereals, whole wheat and whole grain breads, high-fiber/low-fat crackers and biscuits, and whole wheat pasta and noodles. A low fat/high fiber breakfast cereal is one that contains at least 8 grams of fiber and no more than 1.5 grams of fat per serving (usual serving size is $\frac{1}{3}$ or $\frac{1}{2}$ cup, sometimes indicated as 28 grams or 36 grams respectively). A low fat/fiber cracker contains approximately 2.4 grams of fat and 1.5 grams of fiber per $\frac{1}{2}$ ounce serving, and a high fiber bread contains 0.8-1.0 grams of fat per slice (regular slice) and 1.4-1.7 grams of fiber. (These are the criteria readers should use as a guideline when they look at nutrition labels on these products).

Category 4—Low-Fiber Grains and Starchy Carbohydrates

These carbohydrates:

- like Category 3 carbohydrates, contain many carbohydrate calories per serving. In most people, overconsumption will increase body fat and triglyceride levels;
- do not contain much fiber—and so, unlike their Category 3 counterparts, do not offer health benefits to the large bowel. However, don't think that you can never again

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enjoy white bread without causing harm to your body. This simply is not the case. Just do not make it a heavy part of your daily diet.

Category 4 carbohydrates are found in white rice, white pasta, white bread, white potatoes, and low-fiber crackers made from white flour.

Category 5—Refined Sugars

These carbohydrates:

- contain simple sugars that are rapidly absorbed into the bloodstream and can therefore upset blood glucose levels hasten the conversion of carbohydrates into fat and promote weight gain and diabetes if overconsumed;
- are essentially devoid of nutrients that protect against cancer, heart disease, and other degenerative conditions. The exception: sweet, low-fat snacks that contain some fiber ingredients.

Category 5 carbohydrate foods include white sugar, brown sugar, honey, and many refined sugar products (licorice, jujubes, hard candy, and jelly beans); low-fat frozen treats (sorbetes, sherberts, low-fat frozen yogurt, and popsicles); low-fat muffins and granola bars; angel food cake.

Refined sugars are absorbed into the bloodstream extremely quickly, which can result in a rapid elevation of blood glucose levels. The pancreas must then respond by pumping large quantities of insulin into the bloodstream to lower blood sugar to normal levels. Over your lifetime, an excessive indulgence in refined sugars can over-stimulate the pancreas, forcing it to secrete more and more insulin. The insulin pushes down blood sugar levels, which can trigger a renewed craving for sweets and rebound hypoglycemia.

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This recurring cycle is a common nutritional pattern, contributing to the high percentage of obese people in our society. In response to the refined sugar bombardment, the high levels of insulin secreted by the pancreas also prompt the liver to convert extra carbohydrate sugars into fat. This leads to weight gain and to elevated blood triglyceride levels, a major contributing factor to heart attacks and strokes. Weight gain produces a resistance to the effects of insulin, forcing the pancreas to secrete even higher levels in order to keep blood sugar levels from skyrocketing. A body in this condition is susceptible to the onset of adult diabetes (Type II), also known as non-insulin-dependent diabetes.

Avoid over consumption of Category 5 carbohydrates. In reasonable amounts they can be incorporated into your nutrition game plan without doing damage. (If you are exercising regularly, at a sufficient level of intensity, they pose much less of a threat.)

How Much and Which Category of Carbohydrate?

There is no doubt that your body requires the ingestion of some carbohydrate foods each day. The question is how much carbohydrate should you consume and which carbohydrates should you choose? If you are a marathon runner or participate regularly in endurance sports, then as much as 70 percent of your calories should come from carbohydrate foods. However, if you lead an essentially sedentary lifestyle, you must reduce your carbohydrate calories to as low as 45 percent of your daily caloric intake; otherwise, you will experience weight gain and a host of health problems. For health promotion, disease prevention and anti-aging, a regular exercise program must be an integral part of your lifelong game plan. Even a relatively modest regimen would allow you to consume at least 50 percent of your calories each day in the form of carbohydrates. But what proportion of your carbohydrate intake should come from each category?

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Whether carbohydrate foods comprise 50, 55, or 65 percent of your daily calories, aim to select foods from the various carbohydrate categories as follows:

- **Category 1 carbohydrates** should account for approximately 40 to 45 percent of your daily carbohydrate intake.
- **Category 2 carbohydrates** should be approximately 20 to 25 percent of your daily carbohydrate intake.
- **Category 3 and Category 4 carbohydrates** should be approximately 20 to 25 percent of your daily carbohydrate intake. Emphasize Category 3 as much as possible for fiber content.
- **Category 5 carbohydrates** should be no more than 15 percent of your total daily carbohydrate intake.

Following this formula will help ensure that you consume primarily those carbohydrates that provide important protective nutrients against disease. It will help reduce the chances of weight gain and the development of Type II diabetes, while affording the freedom to consume some desserts and snacks. Be aware of the five carbohydrate categories and begin today to make smarter carbohydrate choices.

Carbohydrates and Weight Reduction

Before leaving carbohydrates behind, let's look more closely at the relationship between carbohydrates and weight loss. The popularity of high-protein/low-carbohydrate diets has persuaded many people to avoid carbohydrates. But complete abstention from carbohydrate foods has serious implications with respect to the prevention of cancer, heart disease, and other degenerative conditions. If you are overweight, don't avoid carbohydrate foods; instead, start concentrating on how to use them in conjunction with protein and a low-fat diet to lose weight. It can be easy. Over the years most of my weight loss clients have said, "I'm losing weight, and I don't even

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feel like I'm dieting." They are really saying that they are not experiencing the unpleasant side effects associated with carbohydrate-deprived diets—hunger, headaches, and irritability. The right amount of carbohydrate foods can help your body naturally attain and maintain your ideal weight in several ways:

- Complex carbohydrates have fewer than half the calories of the same amount of fat. One gram of a complex carbohydrate has four calories; one gram of fat has nine.
- Studies have repeatedly demonstrated that our bodies do not absorb 10 to 20 percent of the calories in many grain-based and whole wheat-based carbohydrate foods. This fact is especially true for starchy foods like pasta, bread, legumes, and rice. Our digestive enzymes cannot finish the job of breaking down these complex carbohydrate foods in the small intestines. Partially digested food passes into the large intestine; no further absorption can take place. In a sense, these are free calories. Next time you look at a calorie counter, you can subtract 10 to 20 percent of the calories listed for these items.
- Category 3 and 4 carbohydrate foods require considerable energy to digest. These energy calories are given off as heat instead of being stored as fat. The process is called thermogenesis. If you eat more of these carbohydrates than your liver can store in its glucose storage tank, 23 percent of the extra calories will be given off as heat from your body as the liver converts extra carbohydrate calories into fat. By contrast, when you eat fat, it is digested, absorbed, assimilated, transported, and stored as fat with an efficiency rate of 93 percent. The truth is that overeating carbohydrate foods, even refined sugars, is much less damaging from a weight gain perspective than eating the same number of calories of fat, especially saturated fat.

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- Starchy complex carbohydrate foods such as bread, pasta, rice, and bananas make you feel full after a meal. They actually shut off the hunger message from your brain. Nutritionists call this feeling satiety—the sensation of being satisfied and content. Eliminating that feeling of hunger is an integral part of weight loss. Diets that make people feel deprived all the time are certain to fail. Fatty foods also produce that feeling of satiety, but they are much higher in calories and more damaging to your health in other ways.
- Complex carbohydrate foods provide the chemical links necessary to burn off body fat. In fact, if your carbohydrate intake is too low, you cannot completely break down body fat, and your body goes into ketosis. In this state the body begins to breakdown its muscle structure (protein) and converts it into glucose in order to prevent extreme hypoglycemia that would otherwise be life-threatening. At the same time the breakdown of fat is so rapid that some of the fat is converted to a water-soluble form called ketones, which increase the acidity of the blood. This is ketosis. This leads to the kind of weight loss that is experienced by cancer patients: up to half of the loss that occurs can be the result of your body breaking down its own muscle protein (muscles are largely made of protein) to make glucose. In this event you build up toxic wastes—ketone bodies—in your system, causing headaches, dehydration, and overwhelming hunger pangs as your blood glucose levels fluctuate at the low end of the normal range or drop below. You look sickly, emaciated, and gaunt.

This form of weight loss also slows down your metabolism. If you break down your muscle mass and convert it into glucose, then your muscles become smaller. Muscles are the motors of the body; even at rest they consume a lot of calories. The more muscle tissue

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you have, the faster your resting metabolic rate. Any weight loss program that encourages the breakdown of muscle tissue, rather than preserving or increasing it, will eventually slow your metabolism and raise the chances that you will regain all of the weight you lost and possibly more once you deviate from the diet—which is bound to happen if you feel carbohydrate-deprived. This is why 90-95% of individuals who lose weight from dieting gain it back within the first two years.

You must also remember that it's not necessarily just the bread and pasta that make you fat; the high-fat butter and sauces on top do much of the damage. How many overweight vegetarians have you met? Not many. Most of them are very slim, and yet their diet is comprised primarily of carbohydrates, albeit not a lot of refined sugars; they are health conscious even in regards to the carbohydrate choices they make. However, starchy carbohydrates and whole grains, fruits and vegetables from Category 1, Category 2 and Category 3 carbohydrates make up the bulk of their diet.

So it's not fair to single out carbohydrate foods in general as the main culprits driving high rates of obesity in this part of the world. The overconsumption of refined carbohydrates and, to some degree, refined grains and starches is a contributing factor, especially when combined with a sedentary lifestyle. But it's also a fact that most people do not consume the five to seven servings a day of fruits and vegetables that are recommended to prevent cancer, heart disease, and other degenerative diseases. You simply need to adjust your carbohydrate intake to match your activity level and, within your carbohydrate strategy, choose appropriately from the carbohydrate categories.

Starting Right Now...

1. Replace high-fat foods with health-promoting carbohydrate foods. Here are some practical examples:

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- Instead of adding butter or margarine to toast or bagels, use jam. Although jams contain some white sugar, most are made from whole fruits and contain added fiber (pectin and gum fiber), which can help keep cholesterol levels down.
 - Instead of high-fat potato chips and dip, nacho chips, or fried treats of this kind, try these complex carbohydrate alternatives:
 - low-fat biscuits, such as melba toast, dipped in salsa
 - baked pretzels dipped in salsa or mustard
 - low-fat popcorn (less than 1.5 grams of fat per 3 cups) with no added butter or high-fat toppings.
 - As a snack between meals choose fruit, raisins or other dried fruits, a low-fat bran muffin, one-half of a plain bagel with jam, or carrot sticks.
2. Don't smother carbohydrate foods with fat. Instead, use tomato sauce on pasta and low-fat yogurt on potatoes or, better still, serve a baked potato with just pepper and chopped green onions.
 3. Dilute fruit juice, adding three parts water to one part juice. Fruit juices are too heavily loaded with simple sugars to be taken straight up.
 4. Whenever possible, eat carbohydrate foods high in anti-cancer, disease-preventing nutrients. Incorporate at least one Category 1 or Category 2 carbohydrate food into every meal.

Fiber

Dietary fiber plays an important role in the prevention of many cancers, cardiovascular diseases, and excess weight gain. Unfortunately, the average North American consumes only about a third of the fiber needed to help prevent these conditions.

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In response to the growing public awareness of the importance of fiber, the food industry has introduced an increasing number of high-fiber breakfast cereals, crackers, and other products. This awareness can be directly attributed to the pioneering research of Doctor D. Burkitt and fellow researchers who suggested that the high-fiber diet of Africans was directly linked to their strong resistance to cancer, diabetes, heart disease, strokes, hemorrhoids, and varicose veins. This research sparked the interest of other scientists, who investigated the specific health benefits of dietary fiber. In the past 25 years, a wealth of knowledge has grown out of their efforts.

Dietary fiber is found only in the earth's vegetation. No food of animal origin contains fiber. There is no fiber in red meat, poultry, fish, dairy products, or eggs. Surprisingly, the important feature of fiber is that we cannot digest it. Fiber is really nothing more than long, branching chains of complex carbohydrates, strung together in such a way that our digestive systems are unable to break them apart. Although some fiber is metabolized by bacteria in the large intestine, much of it passes through the entire length of our intestines almost unaltered. It makes up the bulk of our fecal matter and plays an essential role in maintaining the health of the intestinal tract.

Unfortunately, in the last century we have learned to prefer our food, particularly our grains, heavily refined. We have become more accustomed to white rice, white breads, refined sugars, and refined breakfast cereals, all of which are practically devoid of dietary fiber. As a result, many of us suffer the consequences of fiber deficiency, setting ourselves up for heart disease, excess weight gain, and colon and rectal problems. Our increasingly high-fat, low-fiber diet has contributed to the fact that colon-rectal cancer is the second-leading cancer killer in North America when the statistics for men and women are combined.

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Two Different Types of Dietary Fiber

Scientists have discovered many different types of fiber and have given them specific technical names, like pectin, guar gum, lignin, cellulose, and hemi-cellulose. A simpler approach is to classify these fibers according to their effects in your body: they are either cholesterol crunchers or colon cleaners. Some carbohydrate foods contain high amounts of cholesterol-cruncher fiber, which helps to lower high blood cholesterol and regulate blood sugar levels. Other carbohydrate foods contain more colon-cleaner fiber, which helps protect against cancer of the colon and rectum, and prevent irritable bowel syndrome, constipation and other bowel conditions.

Cholesterol Crunchers—As is well known, elevated cholesterol can clog your arteries over time. Clogged arteries can lead to heart attacks, strokes, and kidney failure. These cardiovascular diseases account for approximately 50 percent of all health-related deaths in our society. Keeping your cholesterol under control now can keep you from joining this statistic later.

Some complex carbohydrates contain the types of fibers that cling like magnets to cholesterol in the intestinal tract; they stop it from being absorbed into the bloodstream where it could do damage. Instead, these cholesterol crunchers drag cholesterol through the large bowel and eliminate it in the feces. They eliminate bile acids in the same way.

After a meal, bile acids are secreted by the gallbladder to aid in fat digestion. These bile acids tend to be reabsorbed into the body and converted into cholesterol by the liver. The presence of cholesterol crunchers in the intestine stops the absorption of bile acids and promotes their elimination.

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An average fasting blood cholesterol level for North Americans is approximately 215-225 milligrams per hundred milliliters of blood—or 215-225 mg percent as it is commonly expressed (in Systeme internnal units, 5.85 millimoles per liter of blood, or 5.85 mmol/liter). In a society where 50 percent of people die from cardiovascular disease, the average cholesterol level is obviously not a healthy benchmark. To be safe, you should strive for a blood cholesterol level below 200 mg percent (5.2 mmol/ liter). The safest range seems to be between 150 and 160 mg percent (3.9-4.16 mmol/liter).

If your fasting blood cholesterol level is 260 mg percent (6.76 mmol/liter), you are only nine percent above the average, but that margin will double your risk of heart attack. By simply eating one tablespoon of oat bran every day, you can reduce that 260 mg percent to 225, cutting your risk in half. Studies have proven that adding cholesterol crunchers to your daily diet can lower blood cholesterol levels, by 10 to 15 percent on average (and up to 25 percent in some cases). This can mean the difference between life and death.

Cholesterol crunchers also slow down the rate at which carbohydrates in the intestinal tract are absorbed into the bloodstream. Refined carbohydrates such as white sugar, brown sugar, and honey are absorbed into your bloodstream very quickly, which puts undue stress on your liver and pancreas. Cholesterol crunchers help to regulate blood sugar levels.

Finally, they make you feel full, discouraging you from overeating. Cholesterol crunchers will deliver a feeling of satiety faster than any other food except fat—which is not a good way to achieve satiety. To prove this to yourself, eat two apples or a banana or a grapefruit (about 120 calories) the next time you feel hungry between meals. By eating these satiety-producing fruits, you will almost immediately overcome the temptation to eat sweet or rich foods.

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Foods High in Cholesterol Crunchers

The carbohydrate foods that contain the richest supply of cholesterol cruncher fiber are:

- oat bran, oatmeal, and oats;
- psyllium husk fiber (the main ingredient in Metamucil);
- apples, peaches, pears, and plums;
- berries (strawberries, raspberries, blackberries, boysenberries, etc.);
- white rind of citrus fruits (the white layer under the skin of oranges, grapefruits, tangerines, etc.);
- carrots;
- peas and beans, especially chickpeas and kidney beans;
- pumpernickel bread;
- ground flaxseeds, or flaxseed powder, as it is sometimes marketed (but not flaxseed oil).

“Apples, peaches, pears, and plums/Tell me when your birthday comes.” Recite this childhood rhyme three times and you’ll never forget which fruits are high in cholesterol crunchers.

Colon Cleaners—Colon cleaners form the second family of dietary fiber. Like cholesterol crunchers, colon cleaners are not digested or absorbed in the intestinal tract. However, they play a different role in the large intestines. Colon cleaners have been shown to help reduce the risk of colon cancer and promote better regularity of bowel function.

Acting like a sponge, colon cleaners soak up water in the intestinal tract. As a result, the fecal matter formed in the intestinal tract has a high water content, which dilutes the concentration of

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any toxic wastes and cancer-causing agents that may be present. Generally, the higher the concentration of cancer-causing agents, the greater the likelihood that they will cause genetic damage to the cells that line your colon and rectum.

The sponge-like colon cleaners absorb water, expanding the bulk of fecal matter. This expansion exerts a physical pressure against the inside walls of the intestinal tract, which in turn stimulates synchronized contractions of the muscular layers of the intestinal walls. These muscular contractions propel the fecal matter through the intestinal tract and out of the body, decreasing the time your intestines, colon, and rectum are exposed to cancer-causing agents. To improve the function of colon cleaners, you must drink enough water to take advantage of their sponge-like behavior. Six to eight 8-ounce glasses of water every day is widely recommended. You should also be sure to have frequent bowel movements. One per day is excellent; five per week is acceptable; having three or fewer per week is dangerous. An additional benefit is that the high water content of stools formed by colon cleaners makes them soft and easy to eliminate. They require minimal straining and are therefore less likely to cause hemorrhoids and varicose veins. (You will know your stools are sufficiently high in water content if they float.) Rock-hard, pellet-like stools are solid evidence that you lack sufficient colon-cleaner fiber to protect you from one of the most common life-threatening cancers of our day, one that is clearly related to diet.

Where do the cancer-causing agents in the intestinal tract come from? It has been known for some time that protein foods containing nitrates and nitrites, such as bacon, pepperoni, salami, hot dogs, most packaged meats, and most cold cuts, encourage the development of cancer in the colon and rectum. When the protein in these processed meats reacts with the nitrate and nitrite preservatives during digestion, carcinogenic nitrosamines are formed. These nitrosamine chemicals are only one type of cancer-causing agent against which the body must defend itself daily.

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When you eat fats, your liver and gallbladder secrete bile acids into the intestine. Bile acids that are not absorbed back into the body as cholesterol remain in the intestinal tract. These can be converted into cancer-causing agents by the bacteria that line the large intestine. In this way, a diet that is high in fats contributes to the development of colon cancer by stimulating an increased secretion of bile acids. These acids can also be converted into secondary sterols (lithocholic acid and deoxycholic acid) by the bacteria in the large intestine. Secondary sterols promote rapid division of colon cells and can directly damage their genetic DNA structure. Both of these actions increase the chances of colon cancer development.

In North America one in 16 women and one in 15 men develop colon cancer. The incidence of colon cancer in parts of the world where fewer animal fats and more fiber-rich carbohydrates (especially whole grains and beans) are consumed shows as much as a 90 percent lower occurrence of this disease. Most cases of colon cancer could be prevented through healthier diet and lifestyle practices.

Other sources of carcinogens that are known to increase our risk of colon cancer:

- Alcohol generates free radicals—which can cause DNA mutations—and is a co-carcinogen, meaning it drives other cancer-causing agents into our cells with a greater efficiency. Having two or more alcoholic drinks per day is associated with a two- to three-fold increase in the risk of colon cancer, according to several prospective studies (including the Health Professionals Follow Up Study and the Nurses' Health Study).
- Heterocyclic amines are a hazard of barbecuing meat, chicken, or fish; they are formed when fat drips down onto the coals below the grill, and smoke rises from the coals. The smoke contains heterocyclic amines, known to cause cancer. They are also present in smoked meats and smoked fish, including smoked turkey, smoked salmon, and smoked chicken.

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Your intestine is loaded with cancer-causing material and needs the help of colon-cleaner fiber. It is essential to consume a sufficient amount every day from the carbohydrate foods or supplements (flaxseed powder, wheat germ, and psyllium husk fiber) that are the best sources of this important protective nutrient.

Foods High in Colon Cleaners

The carbohydrate foods that supply the highest levels of colon cleaners are:

- wheat bran, including whole wheat bread and biscuits, bran cereals, wheat germ;
- rice bran, including brown rice, puffed rice and whole rice crackers;
- corn bran, corn on the cob, popcorn, cornmeal, puffed corn cereals, and corn flakes;
- peas and beans, especially chickpeas and kidney beans;
- high-fiber breakfast cereals (except oatmeal);
- psyllium husk fiber (the main ingredient in Metemucil);
- ground flaxseed or flaxseed powder (but not flaxseed oil).

Fiber in Your Diet

Keeping track of your daily fiber intake will be easy if you consult the Fiber Scoreboard on page 307. I have assigned points to each food according to its fiber content. A medium apple, for example, scores one point; one point equals three grams of dietary fiber. In order to take full advantage of colon cleaners and cholesterol crunchers, you should try to attain eight to 15 fiber points from a variety of foods every day.

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Starting Right Now...

1. As you eat foods high in cholesterol crunchers, imagine that they are magnets, dragging the cholesterol and saturated fats through your intestinal tract and out of your body.
2. As you eat foods high in colon cleaners, envision them acting like a vacuum cleaner, sucking the carcinogens and other toxins from the walls of your bowels.
3. If you are indulging in a high-cholesterol food, be sure to eat a food high in cholesterol crunchers at the same time. The combination reduces the amount of cholesterol that will be absorbed into your bloodstream.
4. Drink six to eight glasses of water every day. Plenty of water is necessary for colon cleaners to work at their optimal effectiveness.
5. Make sure you are having a bowel movement at least five times a week and check that your stools float. If they do not, drink more water. Pay attention to how your bowel movements are affected by your diet. Get to know your own body rhythms.
6. If foods alone are not providing the fiber you need, take two to three teaspoons of psyllium husk fiber each day (for example, Metamucil mixed in water). Psyllium husk fiber is an excellent source of both cholesterol cruncher and colon-cleaner fiber, and has been shown to reduce high cholesterol levels in controlled clinical trials. Wheat germ also contains respectable amounts of colon-cleaner fiber.
7. Try to eat more Category 3 carbohydrates than Category 4 carbohydrates, when you are choosing grains and wheat products. For example, eat brown rice instead of white rice and whole wheat bread instead of white bread. Every gram of fiber you consume adds up to healthier bowel function in the long run.

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8. Avoid processed meats, including hot dogs, bacon, pepperoni, salami, most packaged meats, and most cold cuts. They are full of saturated fats and cancer-causing preservatives.
9. I suggest that you consume two heaping tablespoons of flaxseed powder (ground organic flaxseeds) per day, about a 50-gram serving. Flaxseeds contain both cholesterol cruncher and colon-cleaner fibers, along with important natural agents that help defend against reproductive organ cancers (breast and prostate), as well as liver and gallbladder disease.

Fats

The high level of animal fat in the North American diet is the number one nutritional cause of heart attack, stroke, certain types of cancer, and obesity. This is no exaggeration. The American and Canadian heart associations, cancer associations, diabetic associations, and the National Institutes of Health in the United States have for years strongly recommended reducing our total fat intake, especially animal fats.

Many health-conscious people are concerned about white sugar in their diets. They fail to recognize that excess animal fat consumption is much more serious than eating sugar. Bacon and eggs for breakfast, pastries for dessert, large slabs of butter melting over a baked potato, cheddar cheese smothering a plate of nachos, processed meats from the local deli: these high-fat foods are the primary dietary killers in our society today. They clog your arteries, overstimulate your hormonal system, and increase the risk of cancers in the reproductive organs, the colon, and rectum.

The scientific evidence is so convincing that the department of the Surgeon General of the United States, always extremely conservative, released a Report on Nutrition and Health in July 1988 presenting its first comprehensive review of the evidence that links diet to chronic disease. The report recognized that the most

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common nutrition-related health problems among people in the United States were due to obesity and unbalanced diets. It identified a reduction in the consumption of fat, especially saturated fat, as the primary dietary priority for improving overall health.

Not only is eating a lot of animal fat related directly to heart disease and some cancers, but it is the major cause of obesity. Your body stores saturated fat from high-fat animal meat and dairy products very efficiently. Digesting, absorbing, transporting, and storing the fat you eat uses up only seven percent of its initial calories. In other words, your body delivers the saturated fat from your diet and stores it in your fat cells with an efficiency rate of 93 percent. When you eat saturated fat you get fat, especially if you have a slow metabolism and reduced muscle mass.

On the other hand, not all fats are bad, and it is essential to eat some fat every day to stay healthy. Certain types of fat, such as the omega-3 fats found in fish, will help protect you from heart disease, stroke, and various cancers. The predominant fat found in olive oil, canola oil, and peanut oil offers similar benefits. There are also some medicinal fats that I recommend be taken each day in a dietary supplement that contains borage seed oil, flaxseed oil, and a high-yield fish oil.

So how much fat is ideal to prevent disease and anti-aging? A few nutrition fanatics insist that you should eat nothing but grains, vegetables, tofu, and brewers' yeast, thus limiting your fat intake to 10 to 15 percent of your total daily calories. This type of program is very difficult to follow and is unnecessarily restrictive for most of the population. A growing body of evidence indicates that you can take as much as 25 percent of your total calories from fat without promoting cardiovascular disease, cancer, or obesity. However, I urge you to limit your fat intake to 15 to 20 percent of your total calories each day. Populations that average fat intakes in this range tend to enjoy extraordinary health and longevity. The exceptions are the Inuit of the far north, whose diet that is 35 to 40 percent fat,

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most of it omega-3 fat from fish. It seems that the consumption of saturated fats from animal products and the consumption of fried foods cause most of the damage to our bodies that are attributable to fat. These sources set us up for weight gain, high cholesterol, cancer, heart disease, and gall bladder disease, whereas other fats are safer and can actually be health-promoting if consumed in the proper quantities.

The Four Families of Fat

Knowing how much fat is enough is more complicated than determining the ideal total intake. The fat in your diet is made up of four different types, or families: saturated fats, polyunsaturated fats, monounsaturated fats, and omega-3 fats (a special type of polyunsaturated fat). You need the proper amount of each family of fat because each affects your health and risk of disease in different ways. A realistic approach to achieving a healthy balance is to get approximately one-third of your fat calories from saturated fats, one-third from monounsaturated fats, and one-third from polyunsaturated and omega-3 fats. In reality, your body has no requirement at all for saturated fat, which does the most damage of all the fats. But the only way to avoid all saturated fat is to become a vegan vegetarian, eating no animal products at all, and strictly avoiding chocolate, palm oil, and coconut oil. Vegans tend have a reduced risk of many degenerative diseases, but few individuals are willing to go to this extreme. Most want to consume some meat and dairy foods as part of their lifestyle, and for them I have developed a program that allows these foods, while keeping the amount of saturated fats within a safe range.

Saturated Fats—Let's look first at this most dangerous family of dietary fat—saturated fats. I've recommended that roughly one third of your total fat intake be saturated fats. Adapting this discipline is one of the most important steps you can take in preventing obesity and cardiovascular and other degenerative diseases.

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Foods High in Saturated Fats

- sour cream, butter, whole milk, cream, ice cream, 2% milk and yogurt;
- cheese that is more than three percent milk fat—that's almost every cheese, including cheddar, blue, brick, colby, cream, muenster and port du salut;
- egg yolks;
- all red meats, all pork products, many processed luncheon meats (hot dogs, salami, bologna, prosciutto, corned beef, pastrami, spare ribs, bacon), and organ meats (liver, kidney, brains);
- chocolate (cocoa butter), coconut oil, palm oil;
- baked goods and candy made with palm oil or palm kernel oil.

Saturated fats interact with cholesterol to give you double trouble. Surprisingly, it's not necessarily the cholesterol in food that elevates your blood cholesterol levels. Up to two-thirds of the cholesterol in your body is produced by your liver; only one-third comes from the cholesterol you eat, unless you are eating a lot of egg yolks and organ meats. Elevated blood cholesterol is most often a result of eating too much saturated fat. When you ingest saturated fat, it is absorbed from your intestines, then carried to your liver, where it stimulates cholesterol production. The more saturated fat you eat, the more cholesterol your liver produces.

Coconut oil and palm oil, used in commercially made baked goods, don't contain any cholesterol at all, but they are heavily loaded with saturated fat. It's their saturated fat content that makes them ideal for baking: they are very stable when heated to high

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temperatures. When these saturated fats enter your body as ingredients in cookies, pie crust, and other pastries, they are transported to your liver, where they switch on that organ's cholesterol manufacturing machine. Chocolate can have the same effect. Chocolate contains no cholesterol but is high in saturated fat content. Beware of foods advertised as being cholesterol-free: this doesn't mean they won't increase the level of cholesterol in your blood.

The situation is worse if you eat foods that contain high levels of both saturated fat and cholesterol. These are found together only in foods of animal origin; cholesterol is produced solely in the tissues of animals (including fish and seafood), not plants.

A Double Whammy: Foods High in Saturated Fat and Cholesterol

- whole milk products (chocolate milk, whole milk yogurt, heavy cream);
- high-fat cheeses, ice cream, butter;
- mayonnaise, egg yolks (not egg whites);
- organ meats (liver, brains, sweetbreads, kidney, heart);
- red meats and pork (for example, hamburgers, steak, pork, lamb and veal, sausage);
- bacon, most cold cuts with the exception of chicken and turkey breast.

Cholesterol, Heart Disease and Cancer

How does cholesterol contribute to the threat of heart disease, strokes, and certain types of cancer? The process is really quite remarkable. One of your liver's primary functions is to transport

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saturated fat to other tissues of the body. This task is not an easy one because fats can't dissolve in your bloodstream; it's a physiological demonstration of the old saying, "Oil and water don't mix." The liver therefore repackages the fat with other, more soluble substances before sending it through your bloodstream: it builds, in effect, a miniature "shuttle bus." The outer frame of the shuttle bus is made up of protein. The inside is filled with saturated fat and cholesterol.

Once the bus is full, it is sealed and sent out of the liver to enter the bloodstream. The outer protein shell of the bus allows part of the fat and cholesterol to dissolve and float freely. As the shuttle bus passes by muscles, it opens its doors and allows some fat to be taken up. As a rule, when your muscles are not working vigorously, they prefer to burn fat, thus preserving their stores of carbohydrates for use as high-octane fuel during strenuous exercise. (Your heart muscle in particular likes to burn fat for energy.) The shuttle bus eventually delivers any remaining saturated fat to your fat cells. Too many deliveries, and the fat cells become enlarged; you begin to look overweight.

But what about the cholesterol in the shuttle bus? It too is delivered to your cells. In the adrenal glands, cholesterol is used to make hormones like cortisone. In the ovaries, it is used to make estrogen and progesterone. In the male testes, it is the building block of the male hormone testosterone. Cholesterol is also necessary for the creation of bile acids, vitamin D, and the fatty, waxy membrane around the outside of every body cell. Your body needs a certain amount of cholesterol to remain healthy. However, when you consume a diet high in saturated fat and/or cholesterol, the shuttle buses transport more cholesterol than your cells require for normal functioning. The shuttle bus doors will open and allow excess cholesterol to exit into the bloodstream, where it will stick to the inside lining of the blood vessel walls. This causes the arteries to narrow, and eventually restricts the circulation of blood.

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This narrowing process, known as atherosclerosis—hardening or narrowing of the arteries—is the major contributing cause of heart disease, stroke, and related cardiovascular diseases. When less blood and oxygen circulates to the heart muscle, the result is an angina episode or a heart attack. A lack of oxygen in the brain cells can bring on an ischemic stroke or cause the vessels to become rigid, losing their elasticity. Then they are more easily ruptured, resulting in a hemorrhagic stroke.

The cholesterol that is left in your arteries by the LDL-cholesterol shuttle bus forms the main component of thickening arterial plaque. Once an artery becomes almost completely obstructed by plaque, you are a prime candidate for a heart attack, stroke, or even kidney failure. Unfortunately, arterial narrowing due to plaque is invisible and painless until the final stages. Death by heart attack or stroke can happen suddenly, with no warning signs.

Almost fifty percent of North Americans die of cardiovascular diseases, most of them as a result of obstructed and rigid arteries. Just because you can't see it or feel it doesn't mean you should ignore it. If you are lucky, you will experience an early alarm—the squeezing chest and arm pain of angina. For at least 25 percent of those people with advanced blood vessel narrowing, though, a fatal heart attack is their first and last symptom of heart disease.

To make matters worse, some evidence suggests that excess cholesterol delivered to your fat tissues, adrenal glands, ovaries, and testes may overstimulate the production of certain hormones, such as estrogen and testosterone. Imbalances in these reproductive hormones have been associated with an increased risk of breast cancer, prostate cancer, and other cancers of the reproductive organs.

When I caution people about the health risks associated with eating high-fat red meats, pork products, cheese, and other foods loaded with saturated fat, they often respond by saying that it's not a problem for them. They burn off the fat with exercise, which prevents them from gaining weight.

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True, you can burn off the fat calories with exercise; however, you cannot burn off the cholesterol your body produces to transport saturated fats through your bloodstream. Every mouthful of saturated fat stimulates cholesterol production in your liver, and if you manufacture more cholesterol than your body needs, it is most likely lodging inside your artery walls. Even marathon-level training and fitness cannot adequately protect your arteries if you consume too much saturated fat.

How much is too much? According to experts like Dr. William Castelli, M.D., for many years the scientific director of the Framingham Heart Study, more than 15 to 20 grams of saturated fat per day puts you at risk for elevated cholesterol, no matter what exercise program you follow. Note that the average intake of saturated fat in North America per day is 70 to 80 grams. The program that I will outline will keep your average saturated fat intake at five to 15 grams per day.

There is no way to win with saturated fat. Even if you have great genetics and your body is able to efficiently clear excess cholesterol from your bloodstream, you are still putting yourself at risk for colon cancer and possibly reproductive organ cancers as well.

Now for a bit of good news: not all cholesterol contributes to a hardening of your arteries. Up to this point, we have been watching only the LDL cholesterol shuttle bus. The liver makes a high-density lipoprotein (HDL) cholesterol shuttle bus, which it also releases to the bloodstream. This vehicle actually vacuums up deposits of LDL cholesterol from your artery walls and carries that cholesterol back to your liver. There it can be used for other purposes, such as producing bile acids. (Of course, if you are still eating foods high in saturated fats and cholesterol, your liver will have too much cholesterol already and will just send it back out to your arteries again.)

Studies have shown that people with high levels of HDL cholesterol (the good guys) and low levels of LDL cholesterol (the

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bad guys) are much less likely to experience heart attacks or the advanced stages of atherosclerosis. Some recent research has confirmed that raising levels of HDL cholesterol can actually reverse hardening of arteries that has already occurred. Certainly, the ratio of LDL to HDL cholesterol levels can tell your doctor a lot about your chances of developing cardiovascular disease. Next time you are having blood work done, ask to see where you stand. But even if your LDL-to-HDL ratio is low, remember that it is easier to cut back on saturated fat and cholesterol now rather than wait until the damage is done.

Allowable Sources of Saturated Fat

- Chicken, turkey, and Cornish hens
- Cheese that is under 4% milk fat
- Skim milk and 1% milk
- Non-fat and 1% yogurt

Polyunsaturated Fats—Unlike saturated fats, polyunsaturated fats are essential for good health. Early studies showed that corn oil, a substance high in polyunsaturated fats, could lower blood cholesterol levels. However, we know today that some polyunsaturated oils may present more dangers to your health than benefits. First, polyunsaturated fats contain many unstable bonds between constituent atoms that allow them to be easily converted into cancer-causing free radicals when heated to high temperatures (by deep frying or pan frying, for example).

Animal studies have shown that a diet rich in certain polyunsaturated fats (corn oil and other vegetable oils high in linoleic acid) increases the incidence of cancerous tumors when

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these unsaturated fats are combined with carcinogens, then fed to animals with transplanted tumors or to animals that have been bred to express a genetic vulnerability to a certain type of cancer. By contrast, lower tumor incidences in the same studies were associated with consumption of omega-3 fats (from fish or flaxseed oil), and in some cases the consumption of monounsaturated fats (often from olive oil). It seems that certain unsaturated fats may increase our risk of cancer, through their conversion to a hormone known as prostaglandin hormone series-2. This prostaglandin hormone increases the replication rate of cells in the body, which increases the chances of genetic mutations occurring.

A second threat develops from the tendency of certain polyunsaturated fats to become the building block of a chemical called thromboxane. Thromboxane prompts the blood platelets to stick together more readily than normal, resulting in clogged arteries and inflammation in the artery walls. In addition, thromboxane encourages the arteries to go into spasm, contributing to further narrowing.

If you want to keep your blood vessels open and minimize your risk of heart disease or stroke, keep the amount of thromboxane you produce from polyunsaturated fats as low as possible. I recommend that you avoid corn oil, sunflower seed oil, safflower oil, and soybean oil, along with mixed vegetable oils and the products made from them.

Avoid Foods High in Polyunsaturated Fat

- most vegetable oils, including corn oil, sunflower seed oil, soybean oil, and safflower oil;
- partially hydrogenated foods, such as margarine, shortening, and processed peanut butter.

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Partially hydrogenated foods, such as margarine, vegetable shortening, and processed peanut butter, can be especially dangerous. These foods are made from polyunsaturated fats that have been made more concentrated. Although this process gives them a solid consistency and greater “spreadability,” the body has difficulty absorbing partially hydrogenated polyunsaturated fats; it does not know what they are. Recent studies have demonstrated that hydrogenated fats raise cholesterol levels just as saturated fats do. These fats also encourage the formation of thromboxane and other potentially harmful substances. They are best avoided or kept to a minimum.

Monounsaturated Fats—The third family of fats is composed of monounsaturated fats, found mainly in olive oil, peanut oil, and canola oil. These fats help lower cholesterol but are much more stable than polyunsaturated fats when exposed to heat, air, and light. They are not easily converted into free radicals. Mediterranean and Asian civilizations have relied on olive oil and peanut oil as their main sources of dietary fat for thousands of years. In general, people from these cultures have less risk of heart disease and certain forms of cancer than North Americans. We know less about rapeseed oil, commonly known as canola oil, because it is a relative newcomer to our tables. However, recent research suggests that it provides the same benefits as olive oil and peanut oil. Conveniently, all three contain small amounts of polyunsaturated fats. Your body does need some polyunsaturated fats, but not the excess found in corn oil and related polyunsaturated fat oils.

Some new evidence suggests that olive oil can help to lower blood pressure and improve the regulation of blood sugars, as well as to reduce levels of cholesterol in the blood. Considering all these features, olive oil, peanut oil, and canola oil should become the main sources of oil in your diet. Approximately one-third of your total dietary fat intake can consist of monounsaturated fats. Use them for salad dressings, to sauté vegetables, to make stir-fry dishes, or to brown poultry.

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The Benefits of Olive Oil and Peanut Oil

- they help lower the level of cholesterol in your blood;
- they help lower your blood pressure;
- they improve the regulation of blood sugar;
- they are not as carcinogenic when exposed to light, heat, or oxygen as polyunsaturated vegetable oils are, and they do not make your blood sticky;
- they help maintain levels of HDL (the good cholesterol).

About Nuts, Seeds and Avocados—Many nuts, seeds, and avocados contain monounsaturated fat, but they deliver large amounts of all types of fat, which can easily contribute to weight gain and obesity. When it comes to monounsaturated fats, your body benefits from small quantities, such as a teaspoon of olive oil in salad dressing. Although it is a healthier fat, it is still fat, and any excess fat calories you consume will be delivered to your fat cells to be stored. You can eat avocados occasionally, but don't make them a frequent addition to your meals. It is best to avoid nuts, seeds, and olives, unless you are a vegan vegetarian consuming no meat or dairy products at all. A small snack of mixed nuts and seeds is a better option than chocolate bars or doughnuts, but don't make them a regular part of your diet. You just don't need that much total fat.

Omega-3 Fats—The fourth family of fats are the omega-3 fats, a special type of polyunsaturated fat found in fish and seafood. In general, the higher the fat content of the fish, the greater the amount of omega-3 fats. Flaxseed oil also contains a unique omega-3 fat called alpha-linolenic acid, which provides health benefits similar to those of the omega-3 fats from fish and seafood.

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Fish and Seafood Especially High in Omega-3 Fats

- anchovies, clams, crab, halibut, herring, mackerel, mullet, mussels, red snapper, rockfish, salmon, sardines, shad, swordfish, trout, tuna

Some populations, such as the Inuit and those in Japan who live in fishing villages, enjoy especially low incidences of heart disease and cancer. Research findings suggest that people who rely substantially on fish, particularly fatty fish, as their main source of protein have significantly reduced risks of heart disease, related cardiovascular conditions, colon cancer, and cancers of the reproductive organs, compared to populations that consume lower quantities of omega-3 fats. Inuit who have migrated to southern Canada and Japanese who have moved to North America soon find that if they adopt the typical North American diet, high in saturated fats, their incidence of cardiovascular disease and cancer becomes the same as ours.

Omega-3 fats seem to lower blood cholesterol levels significantly when they are substituted for foods high in saturated fats. Preliminary intervention studies have shown that when individuals with high levels of cholesterol in their blood eat more fatty fish, their cholesterol levels are reduced. Omega-3 fats also make the blood less likely to form abnormal clots on the inside of blood vessel walls, thanks largely to their conversion into prostaglandin series-3 hormones within the cells of the cardiovascular system. Omega-3 fats are the building blocks of prostaglandin series-3 hormones, which reduce the stickiness of blood platelets and abnormal clotting of the blood. That clotting is a frequently encountered lethal step towards a heart attack or ischemic stroke.

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Because of these benefits of omega-3 fats, I encourage the frequent consumption of fish and the occasional consumption of seafood. Note that seafood—clams, mussels, shrimp, lobster, and crab—contains higher amounts of cholesterol than most fish. However, if your cholesterol is normal (below 200 mg percent; 5.2 mmol/liter) and you do not have established heart disease, then substituting seafood once or twice a month is perfectly acceptable in my view.

Fighting the Fat Temptation—Without a doubt, foods that are high in fat, especially saturated fat, are considered the most delicious and satisfying in our diets. From my experience with patients, the greatest dietary challenge tends to be cutting back on the amount of unhealthy fat they eat. It is also the most important and life-enhancing change you can make in your eating habits. It's up to you to start overcoming the fat temptations in your life.

I know you're going to indulge in butter, pastries, mayonnaise, or ice cream from time to time. It's almost impossible not to—and it's not the end of the world. It's what you regularly do on most days that really matters. Keep making wellness choices from moment to moment. With time, you will have fewer and fewer setbacks.

Make a commitment to yourself now to cut back on the amount of bad fat you eat. Then make these promises a reality. Know that saturated fat from animal products and fried foods is your number one health enemy.

Natural Supplements That Lower Cholesterol and Triglycerides

If your cholesterol is already high (above 200 mg percent or 5.2 mmol/liter), it is extremely important to keep your saturated fat and cholesterol intake down by consistently choosing the carbohydrate foods that provide cholesterol-cruncher fiber. In addition, there are two outstanding natural supplements that are proven to

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reduce high cholesterol levels without producing adverse side effects. These natural cholesterol-lowering agents are gum guggul and Artichoke Leaf Extract.

As you know, the statin drugs that are often prescribed to lower cholesterol are known to cause liver damage, and thus require the monitoring of liver enzymes in those who use them. Other side effects of these drugs include fatigue, upset stomach, gas, constipation, and abdominal pain and cramps. In rare cases muscle pain can occur, and may progress to a life-threatening condition known as rhabdomyolysis. Statin drugs, which block the synthesis of cholesterol in the liver, include lovastatin (prescription name: Mevacor), pravastatin (Pravachol), simvastatin (Zocor), fluvastatin sodium (Lescol, Lescol XL), atorvastatin calcium (Lipitor), and rosuvastatin (Cestor).

Such drugs are often unnecessary. The same cholesterol-lowering effect can often be achieved by a natural supplement that contains gum guggul and artichoke leaf extract. Gum guggul (botanical name: Gugulipid) is a gummy resin derived from the mukul myrrh tree. In human clinical trials it lowered both cholesterol (which was lowered by 14 to 27 percent) and triglycerides (lowered by 22 to 33 percent) within a four-to-12-week period. Gum guggul is very non-toxic. Occasional side effects include minor intestinal upset, skin rash, diarrhea, and nausea.

Artichoke Leaf Extract contains active constituents that help flush cholesterol from the body via the fecal route. It increases the flow of cholesterol (and bile, which is a building block of cholesterol) from the liver to the intestinal tract. Human studies indicate that artichoke leaf extract alone can reduce LDL-cholesterol (the bad cholesterol) by 23%.

The effective grade of artichoke leaf extract is standardized to contain 13-18% caffeoylquinic acids and the effective grade of gum guggul is standardized to contain 2.5% guggulsterones.

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I have formulated a cholesterol-lowering supplement which I make available to my patients and other health professionals. It contains, in one capsule, 500 mg (standardized to 2.5 percent guggulsterone content) gum guggul and 200 mg (standardized to 13 - 18% caffeoylquinic acid) artichoke leaf extract. Individuals with high cholesterol are directed to take four to six capsules per day (one or two capsules, three times per day). These two natural agents have been largely overlooked by Western medicine, but their effectiveness and safety profile make them an excellent intervention to help lower cholesterol in individuals whose diet and exercise are not enough to keep cholesterol and triglyceride levels within a safe range.

Starting Right Now...

1. When you consume high-fat animal foods—red meat, pork, organ meats, cheeses, pizza with cheese, cream in your coffee, sour cream or butter on your baked potato, or butter on your toast—visualize the arterial plaque that is building up on the insides of your artery walls. This visualization process is the first step in overcoming the temptation to eat high-fat, disease-promoting foods.
2. Stop using butter; it's almost pure saturated fat. Instead spread a little jam on toast and moisten sandwiches with lettuce, tomato, cucumber, or a touch of olive oil.
3. Try to avoid all foods that are high in cholesterol and saturated fat. Switch to low-fat dairy products (skim milk, low-fat cheeses, “light” sour cream, and low-fat yogurt) and low-fat flesh products (poultry and fish).

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4. Think twice before eating foods advertised as “cholesterol-free.” They may be high in saturated fat, which switches on your body’s production of cholesterol. In particular, avoid products that list palm, palm kernel, or coconut oil on the list of ingredients. Remember that chocolate is also loaded with saturated fat.
5. Use margarine and processed peanut butter only occasionally, if at all. They contain partially hydrogenated fats that can elevate cholesterol levels and increase the stickiness of your blood. Even fresh made, unadulterated peanut butter is high in total fat and I do not recommend it for regular use, as is the case for eating most nuts, olives and seeds.
6. Use olive oil, canola oil, or peanut oil instead of other vegetable oils to sauté vegetables, brown chicken or turkey, in a stir-fry, and in salad dressings. Avoid corn oil, sunflower seed oil, soybean oil, safflower oil, or mixed vegetable oils.
7. Avoid any kind of deep-fried or pan-fried foods.
8. Choose varieties of fish that are especially high in omega-3 fats on regular basis.

Protein

In the Northern American diet, the major sources of dietary protein are foods of animal origin—meat, poultry, egg whites, fish, and dairy products. The secret to using protein foods in a health-promoting way is to choose those that are high in protein, but low in saturated fat and cholesterol.

The principal role of dietary protein is to provide the major framework material for your muscles, bones, teeth, hair, and nails. Protein helps build and rebuild your body’s supporting tissues from day to day. It also performs other roles, such as enzyme formation, transportation of nutrients through the bloodstream, immune system functions, hormone formation, and more. Clearly, consuming

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the right amount of protein each day is critical to your health. In my program, 20 to 40 percent of your total calories each day are derived from protein. (Like fats and carbohydrates, protein is measured in calories even though it is not primarily used by your body as fuel.)

It's important not to overconsume protein. Overconsumption forces the body to convert some of the excess protein to saturated fat. A high protein intake also generates by-products like urea and uric acid, which can stress the kidneys and may lead to attacks of gouty arthritis in some people.

For simplicity, I have divided the allowable low-fat protein foods into two categories: low-fat flesh protein foods and low-fat dairy protein foods. Both protein sources provide high-quality protein, and each contributes other nutrients to your overall wellness store.

Protein from Low-Fat Dairy Foods

Once a day, you should have a generous serving of a low-fat dairy product such as low-fat milk, yogurt, or cheese. Almost all dairy products display the percentage of milk fat—abbreviated as “% M.F.”—on the container. A low-fat cheese will be labeled 3% M.F. or less; a low-fat milk, buttermilk, or yogurt will say 1% M.F. or less. Although egg whites are not officially dairy products, I have them on the list of choices. Egg yolks contain saturated fat and 250 mg of cholesterol per egg. On any given day you should consume no more than 150 to 200 mg of cholesterol, so egg yolks are off the list. However, egg whites are an outstanding source of high-quality protein.

If you restrict your dairy intake to these products, you will help ensure that your total calories from fat will be less than 20 percent. These foods are important not only because they are high in protein and low in cholesterol, but because they contain essential minerals and vitamins, most notably calcium and vitamin D.

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Low-Fat Dairy Protein Foods

- skim or 1% milk
- yogurt (1% M.F. or less)
- egg whites
- cheese with 3% M.F. or less
- buttermilk (skim or 1% M.F.)

Calcium from Low-Fat Dairy Foods

Calcium is essential to your health regardless of age. Critical to the maintenance of strong bones and teeth, it is also important for normal heart rhythm, muscle contraction, blood clotting, and the regulation of blood pressure. Preliminary evidence suggests that optimal calcium intake can help reduce high blood pressure and prevent its onset. Calcium and vitamin D may be significant in the prevention of colon cancer.

Equally vital, calcium prevents osteoporosis, a condition in which calcium is reabsorbed from the bones back into the bloodstream and then passed out of the body in urine, leaving the bones prone to fracture. In the United States alone osteoporosis affects 15 to 20 million people and accounts for 1.3 million fractures each year. It is especially prevalent among post-menopausal women. Yet osteoporosis is almost completely preventable if your calcium intake is adequate throughout your lifetime, and if you have sufficient vitamin D in your diet, remain physically active, and maintain a healthy weight. Smoking and alcohol consumption encourage osteoporosis, as do other lifestyle influences that affect bone mass.

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Your daily requirement of calcium changes with age. Between 11 and 24 years of age all individuals should ingest 1200 to 1500 mg per day of calcium, a level that has been shown to optimize bone density and forestall the development of osteoporosis later in life. From ages 24 to 50, a daily intake of 1000 mg is adequate to maintain bone density in men and women. After age 50, women require about 1500 mg per day to help prevent bone loss that results from the drop-off in estrogen levels. At age 65, men should also increase their intake to 1500 mg per day, since one in eight men will develop osteoporosis after the age of 50.

The richest and most easily absorbed sources of calcium are dairy products. Numerous studies indicate that the calcium from dairy products is easily absorbed. The vitamin D in milk and most yogurt products improves the absorption of calcium from the intestines to the bloodstream still further. Insufficient blood levels of vitamin D are strongly linked to the development of osteoporosis, along with inadequate calcium intake.

One eight-ounce serving of low-fat yogurt provides 350 to 400 mg of calcium. An eight-ounce glass of milk contains about 300 mg. As for cheeses, three or four ounces of most varieties will supply 300 to 400 mg of calcium. (There are exceptions: eight ounces of cottage cheese has only 130 mg of calcium.)

Calcium is also available from complex carbohydrate sources such as green leafy vegetables (spinach, collard greens, Swiss chard), beans, peas, kale, broccoli, bread, and grain products. As a rule, most teenagers and adults fall short of their daily calcium requirement by at least 500 mg. This is why I recommend taking a high-potency multi-vitamin and mineral every day that contains 500 mg of elemental calcium and 400 IU of vitamin D. Very often additional calcium and/or vitamin D is necessary, as we'll see in the next chapter.

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Calcium Levels in Common Foods

Product	Amount	Calcium (mg)
Low-fat yogurt	1 cup	415 mg
Low-fat milk	1 cup	300 mg
Low-fat cottage cheese	1/2 cup	75 mg
Sardines with bones	3 oz	370 mg
Salmon with bones (canned)	3 oz	165 mg
Processed tofu with calcium sulfate	4 oz	145 mg
Canned shrimp	3 oz	100 mg
Cooked lentils	1 cup	75 mg
Chicken	3 oz	10 mg
Tuna	3 oz	5 mg
Collard greens	1/2 cup	180 mg
Spinach	1/2 cup	85 mg
Stalk of broccoli	1/2 cup	70 mg
Orange	1 medium	55 mg
Green beans	1/2 cup	30 mg
Lettuce	1/4 head	15 mg
Orange juice	1/2 cup	10 mg
Apple	1 medium	10 mg
Whole wheat bread	1 slice	20 mg
Cooked spaghetti	1 cup	15 mg
Cooked rice	1/2 cup	10 mg

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Protein from Low-Fat Flesh Foods

Low-fat flesh provides the second source of protein with which you should be familiar. The foods in this category are not only important sources of high-quality protein and low in fat and cholesterol, they are also the major dietary sources of two very important nutrients: vitamin B12 and iron. Here is a list of low-fat protein foods:

Low-Fat Flesh Protein Foods

- chicken breast
- turkey breast
- Cornish hens
- fish
- seafood
- tofu and other soy products (e.g., soy cheese)

Vitamin B12—Vitamin B12 is an essential ingredient for the normal reproduction and replication of all your body's cells. Your cells need it to pass on precise genetic material from one generation of cells to the next. Vitamin B12 deficiency is very serious: the red blood cells become abnormally large, a condition known as megablastosis, and fail to deliver oxygen to the tissues properly. The result can be full-blown pernicious anemia. Cells with short life spans are the first to be affected by vitamin B12 deficiency. The cells that line the respiratory and intestinal tracts may need replacement after only seven to 14 days. Red blood cells live only 120 days. Severe vitamin B12 deficiency also affects the nervous system and the brain.

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Flesh foods are one of the few sources of vitamin B12. Vegetarians are susceptible to vitamin B12 deficiency, because few vegetables, grains, cereals, fruits, legumes, or dairy products contain appreciable amounts.

Iron—We think of spinach and lentils as being high in iron, and indeed they are. But the presence of fiber makes the iron in plant foods difficult to absorb from the intestine into the bloodstream. The fiber will drag up to 95 percent of the iron through the intestines, where it is ultimately expelled as part of the feces. A large percentage of the iron in vegetables, cereals, and legumes is not really available to your body at all. The most easily digested sources of iron are flesh foods. This iron, called heme iron, is bound to protein, so it is easily absorbed into the bloodstream. Chicken, turkey, Cornish hen, and most fish are rich sources of dietary iron.

As a component of hemoglobin in red blood cells, iron has the vital role of transporting oxygen—picking it up from the lungs and carrying it to every cell in your body. Iron is critical for energy production and immune system functioning. Iron deficiency is the leading mineral deficiency worldwide. Up to 50 percent of all women may have at least grade one iron deficiency, because they don't get enough iron in their diets and they routinely lose it through menstruation. Grade one deficiency leads to fatigue, weakness, and a depressed immune system. In more severe cases, iron deficiency anemia may occur.

Eating two low-fat flesh foods every day, combined with a variety of vegetables, cereals, beans, and peas, will help ensure your daily iron requirement. As with calcium, additional iron (about 6 mg per day) from a high potency multi-vitamin and mineral supplement is a prudent strategy. A unique feature of iron is that the body will absorb only as much as it requires, provided you are not bombarding your system with extremely high supplemental doses. If you find yourself regularly feeling tired for no good reason, then ask your physician to check your serum ferritin levels, a

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sensitive indicator of early-stage iron deficiency. If iron deficiency is present, then iron supplementation with prescription-level doses (such as 300 mg, three times per day of ferrous sulfate or gluconate) is warranted.

Free Range Chicken

Although skinless chicken breast is known to be low in saturated fat and cholesterol, the commercially raised chickens we consume today are raised quite differently than chickens raised under more natural conditions. Commercially raised chickens are crammed into closed coops to conserve space and maximize profitability and fed antibiotics and hormones to increase growth and fight disease. It is difficult to assess the extent that these toxins, hormones and other drugs may have on the health of humans if they are ingested on a regular basis. Luckily, eating only skinless chicken breast reduces not only your fat intake, compared to eating other higher fat meat products, but also helps to minimize the ingestion of toxins and hormones that concentrate in the fattier part of the chicken (legs, wings, organs). Free-range chicken represents the healthiest approach to skinless chicken breast consumption. These birds are allowed to run free, which lowers their body fat concentrations, and are fed organic feed, free of pesticides, hormones and antibiotics. Their meat also contains significantly higher amounts of omega-3 fats. Free-range chicken is more expensive and is more difficult to find, but for those with bigger budgets and accessibility to these birds, it is the best way to go.

Some Precautions Regarding Fish and Seafood

Fish is generally regarded as a good source of protein, low in saturated fat and high in omega-3 fats, making it a desirable, health-promoting food. However, fish from coastal waters, particularly near large cities, have alarmingly high levels of toxin concentrations of industrial waste, sewage, pesticides, insecticides,

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PCB's (polychlorinated biphenyls), DDT (dichlorodiphenyl-trichloroethane) dioxin, methyl mercury and lead. Fish tend to accumulate toxins in their fatty tissue and pass those toxins along to us when we eat them. It is best to consume cold-water species like cod, haddock, perch, salmon, dolphin-safe tuna and herring, as they thrive in the open sea, away from the polluted coastal waters. Also limit your intake of fish that consume near the top of the food chain, ingesting the toxins from smaller fish. Such fish include bluefish, carp, catfish, striped bass and trout. Even fish raised in commercial fishponds are not necessarily immune to toxins, as pesticides and herbicides from nearby fields can pollute these ponds.

With shellfish, some health authorities suggest that they are storage tanks of toxins. Shellfish found in coastal waters are reported to feed on debris and are unable to efficiently excrete toxins and pollutants through their outer hard shell casings. They concentrate these toxins and pass them up the food chain to humans upon their consumption. On the positive side, shellfish are high in protein, low in saturated fat, contain low to moderate amounts of omega-3 fats, and varying amounts of cholesterol. How much of a threat the toxins found in shellfish pose to human health is still not clear but as a precaution consume shellfish no more than once or twice a month.

Protein in Complex Carbohydrates

On my program, your principal protein intake includes one serving of a low-fat dairy food and two servings of low-fat flesh protein selections, every day. However, some carbohydrate foods also contain a supplemental amount of protein, which can help meet your daily protein requirement. In fact, most carbohydrates except fruit contain small but important amounts of protein. Especially good sources are peas, chickpeas, and beans. Potatoes, corn, rice, pasta, and many breads and cereals also provide respectable amounts of additional protein.

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How Much Protein Do You Need Each Day?

The more you weigh (especially in terms of muscle mass) and the more active you are, the more protein your body requires to support its lean mass and perform other protein-dependent functions. You can calculate your protein needs by multiplying your weight in pounds by 0.4, 0.5, 0.6, 0.7, or 0.8, depending on your level of activity. To estimate your protein need in grams per day, follow these steps:

1. Review the descriptions and values of these five activity levels and determine which type most accurately reflects your current activity level.

Sedentary: No exercise, no heavy manual work.

Value: 0.4

Mildly Active: Thirty minutes of fat-burning aerobic exercise five to seven times per week. No heavy manual work or resistance training.

Value: 0.5

Moderately Active: Thirty minutes of fat-burning aerobic exercise five to seven times per week; weight training program three or more times per week, or heavy manual labour.

Value: 0.6

More Advanced Activity: Minimum of 30 minutes of fat-burning aerobic exercise five to seven times per week; one hour of high-intensity weight training five or more times per week.

Value: 0.7

Heavy Training: More than 90 minutes of weight training five or more times per week with additional aerobic activity.

Value: 0.8

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2. Determine your activity level type from Step 1, and write its assigned value here: _____

3. Estimate your protein need in grams per day by multiplying your weight in pounds by the assigned value of your activity level type:

___ lbs. x ___ assigned value = _____

My protein requirement per day is _____

Now that you have identified your approximate protein needs in grams per day, become familiar with the number of grams of protein available from the low-fat protein foods highlighted in this section, as outlined in the table below.

It can sometimes be difficult to reach your protein goal once you factor in the increased requirements imposed by exercise. A protein shake that is low in carbohydrates (under seven grams per serving) and fat (under two grams per serving) may be the answer. I use a protein shake mix every morning that provides 25 grams of protein per scoop, less than six grams of carbohydrates and less than one gram of fat. I mix two scoops in a blender with ice cubes and two tablespoons of flaxseed powder. This provides me with 50 grams of protein to start my day, which makes it much easier to achieve the required total daily intake of 130 to 140 grams.

You have to be more careful with protein bars, as they contain higher quantities of refined sugars in addition to the grams of protein they provide. Protein bars can promote weight gain because the sugars will be converted to fat if your body does not need the carbohydrate calories at the time of consumption. Protein bars should be used more as a meal replacement when you've had to skip a meal and find yourself feeling hypoglycemic.

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Protein Foods with Little Fat

Food Portion	Grams of Protein
Chicken 3 oz.	27
Turkey 3 oz.	28
Chicken 1/4 broiled	22.4
Most fish 3 oz.	20
Tuna 1/2 cup	15.9
Tuna 3 oz.	24
Kidney beans 1/2 cup	7.5
Corn 1/2 cup	2.5
Green peas 1/2 cup	4.0
White bread 1 slice	2.0
Typical breakfast cereal 1 serving	2 – 4
Tomatoes 1 medium	1.0
Most fruits 1 serving	0.3 – 0.8
Pasta 1 cup cooked	7
Oysters 6 medium	15.1
Egg white - 1	7
Dairy cottage cheese 5-6 tbsp.	19.5
1% yogurt or 1% milk 8 oz.	8.5
Soy milk low-fat 8 oz.	4
Soy cheese low-fat 1 oz.	7
Rice 1/2 cup cooked	2.0
Green beans 1/2 cup	1.0
Baked potato 1 medium	3.0
Whole wheat bread 1 slice	3.0
Saltines 4 crackers	1.0
Banana 1 medium	1.1
Bagel 1 medium	7

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Starting Right Now...

1. Eat only one serving of a low-fat dairy food and two servings of a low-fat flesh food every day. The size of the servings will depend on your body size and activity level, and thus your total daily protein need.
2. Collect recipes for preparing low-fat flesh and dairy foods such as chicken, fish, and low-fat cheese. Often you can adapt your favorite recipes by cutting back on the fat and making simple substitutions.

Water and Other Fluids

This is the fifth nutritional component in your diet: water and fluids. Many of us walk around every day in a semi-dehydrated state, yet nearly every chemical reaction that takes place in our bodies requires water. This is why dehydration can lead to death so quickly. All of the essential life processes shut down when you are severely dehydrated.

To ensure that your body functions at its best, drink six to eight glasses (1.5 to 2 quarts or litres) of water or other fluids every day. Of course, intensive, prolonged exercise demands an even greater intake of fluids. Maintaining enough water in your bloodstream is necessary for transporting nutrients to your tissues and for pushing your blood through the kidneys. Even partial dehydration will impair your kidneys' ability to filter toxins and waste products from your blood.

Water is important for improving your metabolic efficiency and for burning fat in your tissue cells. If you don't drink enough water, you can hinder the fat-burning process. Water also flushes excess sodium out of your body. Higher sodium levels are linked to high blood pressure in some people. Diuretic foods—foods that increase urine output—will likewise help your body eliminate

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unwanted sodium. All fruits and vegetables in their natural states (not canned or processed) are diuretic foods, but these foods are effective only if you drink enough water each day.

Too Much Salt—Food manufacturers add sodium to everything we eat, from pickles to pancake mix. Most North Americans consume between 1600 and 2300 mg of sodium per day from commercially processed foods alone. They pick up another 1200 mg from the sodium that occurs naturally in food. Then they consume a further 1300 to 2500 mg when they add salt to food in the kitchen or at the dinner table. That brings the total average daily consumption of sodium to between 4100 and 6000 mg. The U.S. Food and Nutrition Board recommends that healthy adults consume only 1100 to 3300 mg of sodium per day.

The effect of excess sodium intake over a lifetime is strongly correlated with the development of high blood pressure. As much as 20 percent of the population will suffer high blood pressure if sodium consumption is too great. High blood pressure has three side effects: strokes, heart attacks, and kidney failure. Excess sodium can also lead to water retention and bloating. Because sodium binds water, it tends to interfere with the body's ability to properly regulate water balance. As if all this were not enough reason for cutting back on your salt intake, excess sodium is mildly toxic and caustic to body tissues.

Even though prepared and fast foods already contain a lot of sodium, one-fourth to one-third of your daily sodium intake is discretionary. If you cut down or eliminate the salt you add to food and cut back on high-sodium processed foods and beverages, you can keep your sodium intake within safe boundaries. At first you may find that unsalted foods taste a little flat. Don't worry; soon the nerve endings on your tongue will begin to transmit new and interesting tastes to your brain, and the real flavors of the food will emerge. Your taste buds will reawaken and, eventually, you'll find you no longer like salty foods.

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If you find it difficult to give up the taste of salt, try a salt substitute. Most contain potassium in place of sodium. If you suffer from any form of kidney trouble, check with your doctor to make sure that additional potassium will not harm you.

Salt Content in Food

Foods that contain less than 25 mg of sodium:

12 oz. soda water

12 oz. diet soft drinks

Less than 75 mg of sodium:

3 oz. chicken

3 oz. turkey

3 oz. fresh fish

3 oz. canned tuna or salmon (low-sodium, water-packed)

Less than 120 mg of sodium:

1 cup low-fat milk

1 cup low-fat yogurt

1/2 cup cottage cheese

1/4 cup shellfish

3 oz. shrimp

3/4 cup lobster

3/4 cup oysters

2 oz. clams

1 slice bread

3 low-fat crackers

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Less than 240 mg of sodium:

- 1 oz. of most low-fat cheeses
- ½ cup of tomato juice
- 2 tbsp. of prepared Italian dressing
- 1 cup of most breakfast cereals

Less than 360 mg of sodium:

- 1 oz. turkey or chicken breast cold cuts
- 5 olives

Less than 1000 mg of sodium:

- 2 tsp. baking powder
- 1 bouillon cube
- 1 dill pickle
- ½ tsp. table salt
- 1 cup of canned or packaged soups

Sources of Fluids

Water—Water should be your most important source of fluids. Unfortunately, tap water is always an unknown quantity; you never really know how safe it is. The United States Environmental Protection Agency has found over 700 organic chemicals in drinking water. Forty of these have been shown to cause cancer in laboratory animals. Three—benzene, chloromethyl ether, and vinyl chloride—are associated with cancer in humans.

Make sure that your drinking water is safe. Installing a high-quality water purification system in your home is often a smart

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idea. Have your water tested by a laboratory if you have any doubts about its purity. If you use bottled water, select brands that have undergone distillation, reverse osmosis, or a combination of reverse osmosis and deionization.

Coffee—Coffee in large quantities (40 cups or more per week) has been linked to cancer of the pancreas and the bladder. It seems to inhibit the cells from correcting genetic mistakes. However, the evidence overwhelmingly indicates that having two cups of coffee or tea per day is not a risk factor for disease. Some of the oils in stronger coffee products, such as espresso and Turkish coffee, raise cholesterol levels to a mild degree. If you are going to drink coffee, have it black or with one percent or non-fat milk; the saturated fat in cream, milk, and non-dairy creamer will do you no good. Adding sugar will increase the chance of enlarging your fat mass if your body does not have an immediate need for additional carbohydrates.

If you are trying to cut down on caffeine, try water-treated decaffeinated coffee or, even better, hot water with lemon, non-caffeinated herbal teas, or coffee substitutes.

Tea—Tea is grown in some 30 countries and, next to water, is the most widely consumed beverage in the world. Although there is only one plant, *camellia sinensis*, tea is manufactured as black (78 percent), green (20 percent), or oolong (2 percent). Black tea is more popular in western countries and green tea is consumed primarily in Asian countries, North Africa, and the Middle East. Leaves intended for green tea are picked by the same method as those picked for black. Black tea is fermented; green tea is not.

Fermentation alters the chemical structure of the tea leaf, permitting principal flavor attributes to emerge. However, green tea offers a higher concentration of polyphenol antioxidants. Three cups usually contains about 300 to 400 mg of polyphenol antioxidants. This represents a significant intake of antioxidant nutrients.

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Animal cancer research using green tea is very compelling. In animal studies green tea has been shown to increase the activities of antioxidant and detoxification enzymes in the lungs, liver, and small intestine. Laboratory studies have suggested that green tea polyphenols may inhibit cancer by blocking the formation of cancer-causing nitrosamines and suppressing the activation of carcinogens in lung, breast, colon, and melanoma cancer cells. Green tea extracts also block estrogen from attaching to estrogen receptors on breast cells, a function associated with decreasing breast cancer risk.

With respect to human studies, the best evidence exists for the prevention of stomach cancer and cancer of the esophagus. There is some indication that green tea consumption may reduce the risk of pancreatic cancer, colon cancer, and bladder cancer; however, more research is required.

Other studies reveal that green tea may have a mild effect on lowering LDL cholesterol, raising HDL cholesterol, and reducing the stickiness of blood platelets and protecting LDL cholesterol from free radical damage. All of these are associated with reduced risk of heart attack and stroke.

My view is that most of us would do well to substitute more green tea for coffee, black tea, and other herbal teas, as a daily beverage. To avoid the stimulant effects of the caffeine, decaffeinated green tea products are widely available.

Alcohol—Studies show that, although one to two alcoholic drinks per day may reduce your risk of heart disease, this amount of alcohol can also increase the risk of colon, breast, prostate, and other cancers. (One drink equals one beer, a five-ounce glass of wine, or one ounce of hard liquor.) The protective effects against heart disease arise from the ability of alcohol to raise HDL cholesterol levels and reduce the stickiness of blood platelets. It's been suggested too that alcohol reduces stress by its sedative effects and

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so is beneficial to the heart. However, aerobic exercise is a better way to raise your HDL levels and lower stress, and there are safer ways to reduce the stickiness of your blood.

Alcohol consumption accounts for at least three percent of all cancers, making it the second-most important lifestyle cause of cancer (after cigarette smoking, which is responsible for approximately 30 percent of all cancers). Alcohol is loaded with empty calories and is classified as a co-carcinogen, in that it carries free radicals into the cells, allowing them to cause genetic damage. Smoking cigarettes contributes to cancers of the lungs, mouth, esophagus, stomach, bladder, pancreas, and kidney. If you smoke and drink at the same time, the alcohol acts as a co-carcinogen; your risk of developing mouth cancer increases 15 times compared to smoking without drinking. Alcohol speeds the delivery of free radicals to your genetic material, and it carries many impurities into the body that may indirectly increase your risk of cancer.

Alcohol consumption also is a leading cause of liver damage and liver cirrhosis, and is associated with many deaths and injuries each year from automobile accidents. Alcohol generates an enormous number of free radicals and thereby accelerates the aging process of our cells. One has only to examine the face of an alcoholic to see the pronounced aging effects of alcohol on the body. Finally, alcohol weakens your immune system.

In the long run, you will probably be healthier if you don't drink alcohol, or limit your consumption to no more than one drink in any 24-hour period. All indications suggest that our bodies can safely detoxify one alcoholic drink per day before we put ourselves at increased risk for cancer. Nonetheless, every alcoholic drink you consume generates free radicals and carries the potential to accelerate the aging process. If you are planning to slow the aging process and reduce your risk of chronic degenerative diseases, you must be very careful with alcohol consumption.

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Juice—When you drink juice, it is best to dilute it first. Drink $\frac{1}{4}$ cup of unsweetened juice with $\frac{3}{4}$ cup of water. Pure juice has had much of its fiber stripped away, so the sugar in the juice, whether added or natural, will be digested too fast, resulting in a bombardment of glucose into your bloodstream.

Diet Soft Drinks and Soda Water—Most regular soft drinks contain white sugar, which can add empty refined carbohydrate calories to your diet, raising blood triglyceride levels and increasing your body fat. These drinks can also upset blood sugar levels by causing a sugar rush. If you like carbonated beverages, soda water or carbonated mineral water with lemon or lime are wiser choices. The occasional diet soft drink may be another alternative, but don't overdo it, as the jury is still out on the possible adverse effects of aspartame.

Aspartame was introduced to the market over two decades ago. Its presence in diet soft drinks, yogurt products, and many other prepared foods has been the focus of controversy ever since. Aspartame consists of two amino acids—aspartic acid and phenylalanine. The critics of aspartame claim that one of the by-products of aspartame metabolism in the body is formaldehyde, a well-known embalming agent. Rat studies show that high intakes of aspartame create what are known as formaldehyde adducts by binding to proteins and nucleic acids, including DNA nucleic acids, in liver cells, kidney cells, and certain blood cells. Hence there is potential for genetic damage that may lead to increased cancer risk in these tissues.

Alarms have been raised that the high phenylalanine load supplied by aspartame can also cause damage to brain cells, perhaps increasing the risk of seizures and brain cancer and aggravating the symptoms of Parkinson's disease. Contradictory animal and human studies have so far failed to substantiate or support these allegations conclusively. A recent study at the Washington University

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Medical School suggested a correlation between the introduction of aspartame and a 10 percent increase in the incidence of solid brain tumors, but subsequent examination of the data disputed any relationship between the two; the incidence of brain tumors has actually declined in recent years.

Prior to 1997 there had been over 6500 anecdotal reports of adverse reactions to aspartame, mostly headaches, seizures, and behavioral and cognitive changes. None have been substantiated, although clinical studies are underway to determine the potential adverse effects of long-term use of this popular artificial sweetener.

On the positive side, aspartame has been shown to reduce high blood pressure in rats due to the conversion of phenylalanine into the amino acid tyrosine. A study on human subjects showed that the inclusion of aspartame-containing foods in a weight loss program (low-fat, low-calorie) resulted in an average reduction of 23 pounds in male participants and 16.5 pounds in female subjects. All participants reported feeling good and sleeping well, with no untoward side effects.

Aspartame's ability to form formaldehyde adducts within DNA is of some concern, yet the totality of evidence to date indicates that it is not increasing the risk of brain tumors or other cancers. Proponents of aspartame cite a study published in *Regulatory Toxicology and Pharmacology* in 2002, a respected scientific journal, which reviewed the safety profile of aspartame's twenty-year history in the market, as well as pre-market toxicology studies. The authors of this review concluded that the safety testing of aspartame has gone well beyond that required to evaluate the safety of a food additive, that aspartame is safe, and that there are no unresolved questions regarding its safety when used as intended. Even so, because research continues, my advice is to not overdo it with aspartame-containing foods and beverages, limiting your consumption to one or two servings per day (roughly 80 mg of aspartame).

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Starting Right Now...

Pay attention to what you are drinking and how much. Increase the amount by one or two glasses a week until you are consuming six to eight glasses of fluids each day. You may include beverages such as decaffeinated coffee, tea, and soda. Do not count coffee or tea containing caffeine or alcohol: their fluid content is offset by the fact that they increase water loss through urination.

For access to the references to Step 1 and additional education on wellness please visit the author's web site at www.meschinohealth.com