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## WHAT ARE THE EFFECTS OF DIET ON BLOOD CHOLESTEROL?

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### The Concern

Should we cut our intake of cholesterol and saturated fats? Many health authorities have been urging such reductions to help combat coronary heart disease (CHD).

Excluding the greatest cause of death and disability in the United States, the next nine leading causes added together would not equal number one: coronary heart disease. More than one million heart attacks occur in the U.S. each year and cause more than a half million deaths.

### Dietary Effects in General

Our diets have a profound influence upon cholesterol synthesis in the body. If we fast, less cholesterol is produced; if we ingest fat, we stimulate the cholesterol biosynthesis of the liver. Cholesterol synthesis also is regulated (or affected) by several other factors, including certain hormones, bile acids, and the degree of saturation of the fatty acids in the diet. Bile acids directly inhibit synthesis in the intestinal mucosa, while unsaturated fatty acids reduce plasma cholesterol by some unknown mechanism.

Consumption of cholesterol itself by humans leads to a reduction in overall cholesterol synthesis. Such compensatory mechanisms are very effective for most individuals. In those individuals in which the mechanism is not effective, we see a rise in blood cholesterol. In those who are prone to increased tissue deposition, there may be enhanced risk of atherosclerosis. On the other hand, some people with high blood cholesterol levels may not be at risk.

We are continually confronted with information telling us that by simply avoiding certain foods we can reduce our chances of heart disease. We are promised both increased quality and length of life. Will a decrease in foods containing cholesterol and animal fat do this for us?

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## The Assumption

Let us suppose that we were all of the same genetic stock, living under the same environmental conditions, subject to identical stress, living at the same pace, with equal activities and consuming monotonously similar foods, prepared in like fashion. If we were also subject to great dietary-induced fluctuations in our blood fats and were subject to lesions caused by the fats, application of these dietary rules would probably benefit all of us: reduce cholesterol intake to less than 300 mg per day, consume no more than 35 percent of all our calories as fats and oils, and eat less than 10 percent of our calories as saturated fat.

We have cloned cells in very controlled laboratory situations, but we humans do not exist as clones (as of yet) and have never lived in identical situations. Therefore, these cholesterol-reducing measures are not equally effective or necessary for each of us.

## Complex Carbohydrates and Cholesterol

Our understanding of dietary influences upon cholesterol is far from complete, but recent studies indicate that complex carbohydrates, such as whole oats, oat bran, gum arabic and pectin, reduce serum cholesterol. These dietary fiber sources seem to have one very important thing in common: they are higher in soluble fiber than in insoluble fibers, such as those found in cellulose and wheat bran. These soluble fibers reduce cholesterol by mechanisms other than simply increasing bile salt loss. One interesting area of study involves the effects of increased fiber fermentation by gut bacteria, when they are provided with increased dietary fiber.

Numerous research projects indicate that many of the foods our ancestors consumed in larger quantities than we presently do seem to have a definite protective effect in regard to the intake of fats.

## The Future

There may be very good alternatives to our present diet, other than harping on the elimination of such wholesome foods as eggs, beef, pork, lamb and milk products. Indications are, that for the cholesterol-susceptible population (a minority), if we concentrate on the types of carbohydrates that we consume, especially on those of a complex nature with higher soluble fiber content, we may be able to "have our cake and eat it too."

We would all like to have an easier answer to the problems of health. In one area, nutrition, we may be able to improve the prospects by relying on foods that are less refined, such as fruits, vegetables and whole grain products. There are also economic advantages to utilizing the higher-fiber foods. They are usually less expensive at the marketplace and may represent much larger savings in medical expenses in the future.

In summary, the type of fat that we consume may not be of critical importance if the carbohydrates normally consumed are selected more carefully. Another very important consideration is the need to increase our physical activity to help combat the "American Disease" (millions of Americans are at least 20% overweight). Therefore, through non-traumatic dietary changes (increased complex carbohydrates) and blood lipid changes brought about by physical activity (and weight reduction), we could probably dramatically improve the coronary heart disease picture.