

SURVEILLANCE

Vegetarian diets, chronic diseases and longevity

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Abstract: Vegetarians form a non-homogenous group consisting of semivegetarians (plant food, dairy products, eggs and fish), lacto-ovo vegetarians (plant food, dairy products, eggs) and vegans (plant food only). According to pure vegetarian ideologists, people consuming vegetarian diet have better health and live longer than nonvegetarians, because persons consuming milk, dairy products, meat, eggs and fish are at health risk. In fact the most healthy people in Europe are inhabitants of Iceland, Switzerland and Scandinavia, consuming great amounts of food of animal origin. Meta-analysis of several prospective studies showed no significant differences in the mortality caused by colorectal, stomach, lung, prostate or breast cancers and stroke between vegetarians and “health-conscious” nonvegetarians. In vegetarians, a decrease of ischemic heart disease mortality was observed probably due to lower total serum cholesterol levels, lower prevalence of obesity and higher consumption of antioxidants. Very probably, an ample consumption of fruits and vegetables and not the exclusion of meat make vegetarians healthful. Now, the largest cohort study of diet and health on more than half million of persons, the European Prospective Investigation into Cancer and Nutrition (EPIC) study, will bring new data on the relationships between diet, lifestyle and environmental factors and the incidence of cancer, cardiovascular and other chronic diseases. Vegetarianism is a form of food restriction; and in our overfed society, food restriction is a plus unless it results in a nutritional deficiency (Fig. 1, Tab. 2, Ref. 18). Full Text (Free, PDF) www.bmj.sk.

Key words: vegetarians, longevity, ischemic heart disease, cancer, total mortality.

In past decades, a notion originated that a vegetarian diets are the healthier dietary option. Many health experts and health agencies are urging people to eat less animal products and to consume more legumes, grains, nuts, vegetables and fruits, because the meat consumption may be associated with shorter life. Sectarian and eloquent “nutritional specialists” claim the traditional foods like milk, cheese, fish and dry-land animal meat to be a harmful part of human diet. Ideologist of vegetarianism claim that they belong to the healthiest people, and they can live at least ten years longer than meat eaters. The aim of this review is to analyze these data.

Definition of vegetarian diets

There are various kinds of vegetarianism which favor the consumption of various foods (Tab. 1). Many nutrient intakes and lifestyle characteristics differ markedly between these groups. Semivegetarians and vegans represent the extremes and fish eaters and vegetarians usually have intermediate rules. According to the majority of experts, semivegetarian diet is nutritionally complete and there is no serious danger of some nutritional defi-

ciencies for such consumers. On the other side, strict vegan diet could be nutritionally incomplete.

Vegetarian diets and longevity

According to the vegetarian ideologists, people consuming a vegetarian diet have better health and live longer than nonvegetarians, because persons consuming milk, dairy products, meat, eggs and fish are at health risk. In Europe, we have simple evidence against this claim. The most healthy people in Europe are inhabitants of Iceland, Switzerland, Sweden and Norway, consuming great amounts of food of animal origin (Tab. 2). In these countries, the life expectancy at birth is highest in Europe, at least 7–10 years longer than in Slovakia and 17 years longer than in the Russian Federation (1). Similar differences can be found in the *healthy life expectancy* estimates made by WHO, using the Sullivan method based on the age-specific information on the preva-

Tab. 1. The composition of the main types of vegetarian diets.

Type of diet	Red meat	Dairy	Eggs	Fish
Semivegetarianism	No	Yes	Yes	Yes
Lacto-ovo vegetarianism	No	Yes	Yes	No
Lacto vegetarianism	No	Yes	No	No
Ovo vegetarianism	No	No	Yes	No
Veganism	No	No	No	No

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Tab. 2. Basic health parameters of 4 countries with the highest consumption of meat and milk in Europe (most recent WHO data).

Country	Life expectancy (years)	Healthy life expectancy (years)	Nutrition and life style
Iceland	Males: 80 Females: 84	Males: 72 Females: 74	Fishes from the unpolluted waters of the North Atlantic, lamb meat, cheeses and other dairy products, poultry, wild geese, vegetables, fruits. High physical activity. Low prevalence of obesity
Swiss	Males: 79 Females: 84	Males: 71 Females: 75	Very high consumption of milk and cheeses. Nutritious behaviour is changing: more fish and less meat. High consumption of vegetables and fruits
Sweden	Males: 78 Females: 83	Males: 72 Females: 75	Dried, smoked, salted, or pickled fishes, dried fruits and jams, fermented milk, fruits. High physical activity. Low prevalence of obesity
Norway	Males: 78 Females: 83	Males: 70 Females: 74	Dairy products are heavily consumed. Dried or smoked fishes, fermented milk, fruits. High physical activity. Low prevalence of obesity

lence of non-fatal health outcomes (1). Obviously, life expectancy depends not only on nutrition but on many other factors, which are simply defined by the Human Development Index (2). HDI is a composite index measuring the average achievement in three basic dimensions of human development – a long and healthy life, education and a decent standard of living. In Scandinavian countries and in Switzerland, this index is very high.

In the scientific literature there are surprisingly only few studies on vegetarian longevity. The meta-analysis of five prospective studies published in 1999 (3) compared the death rates from common diseases of vegetarians with those of nonvegetarians with similar lifestyles. Data for 76,172 men and women showed only a small difference in total mortality between vegetarians and nonvegetarians (3). Data combined in 2003 from four British studies (4) showed that mortality for major causes of death was not significantly different between vegetarians and nonvegetarians. A small reduction in mortality from ischemic heart disease (IHD) among vegetarians was compatible with the reduction previously reported in a pooled analysis of mortality in Western vegetarians.

Vegetarianisms and cardiovascular diseases

The comparison of health status of vegetarians with the general population is biased because much of the difference is attributable to non-dietary lifestyle factors such as the avoidance of smoking and a higher socio-economic status of vegetarians. “Health-conscious” non-vegetarians in these studies have similar, slightly higher mortality. Vegetarians have a moderately lower mortality from IHD than the nonvegetarians but there is little difference in mortality from all other major causes of death (Fig. 1).

There are at least four factors causing a moderately lower IHD mortality in vegetarians:

- A low serum concentration of total cholesterol caused by a negligent intake of exogenous cholesterol and by a low intake of saturated fatty acids. Numerous research groups found lower cholesterol values in vegetarians (5–8).

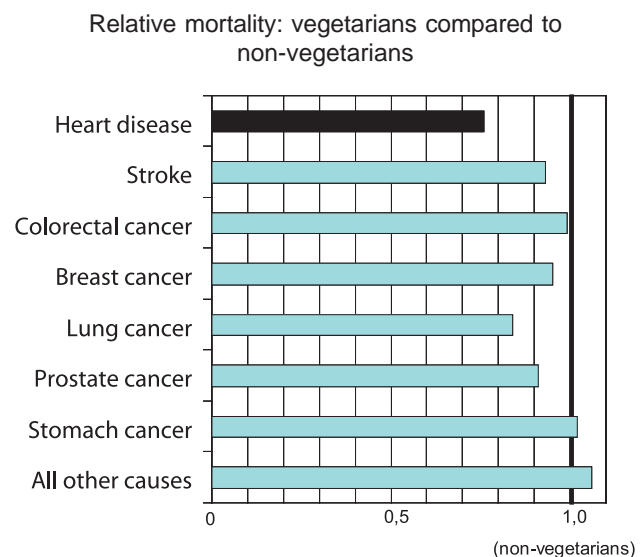


Fig. 1. Graph is based on the meta-analysis of 5 prospective studies (over 76 000 persons followed 10.6 years). The difference between vegetarians and non-vegetarians was significant only in the ischaemic heart disease (3).

- Vegetarians and especially vegans have a significantly lower prevalence of obesity than meat eaters. Differences in macronutrient intakes (protein, fat, carbohydrate, dietary fibre, sugars, alcohol) accounted for about half the difference in mean body mass index (BMI) between vegans and meat eaters. High intake of energy from animal sources and low intake of dietary fibre were the factors most strongly associated with an increasing risk of overweight and obesity (9).

- A slightly lower blood pressure in vegetarians. In EPIC-Oxford study the difference in mean systolic blood pressure between meat eaters and vegans was about 3 mmHg (10). This difference disappeared after adjusting for BMI. A lower prevalence of overweight and obesity accounts for majority of the varia-

tions in blood pressure between the vegetarians and “health-conscious” non-vegetarians.

– A significantly higher antioxidant status in vegetarians caused by a higher consumption of vegetables and fruits (11, 12). Chronic marginal vitamin C deficiency found in Russia and other post-communist countries is probably one of the risk factors for very high IHD and stroke mortality in this region (13). In vegetarians, a reduced risk of lipoperoxidation was found (14). The resistance of low density lipoproteins (LDL) to *in vitro* oxidation, as measured by the kinetics of conjugated diene formation, was not altered in vegetarians. The vegetarian nutrition favorably affected thiobarbituric acid reacting substances in LDL and total plasma antioxidant capacity (15).

Vegetarianisms, cancer and other chronic diseases

The belief that meat, in particular red meat, contributes to cancer is a popular idea. For example, sausages are usually implicated in cancer causation. Five prospective studies were pooled in a collaborative analysis of cancer mortality in vegetarians and non-vegetarians (3). Data were available for more than 76 000 persons of whom nearly 28 000 were vegetarians. There were 8 330 deaths in adult persons after the average 10.6 years of follow-up. No significant differences in the mortality caused by colorectal, stomach, lung, prostate or breast cancers were found (Fig. 1).

The claims that vegetarian diets offer protection from certain chronic diseases like osteoporosis or kidney disease and even from aggressive behavior were never proved.

We should wait for the important new data from the European Prospective Investigation into Cancer and Nutrition (EPIC) study which is the largest cohort study of diet and health. Coordinated by the International Agency for Cancer Research (part of WHO), the study includes 520 000 people in 10 European countries (Denmark, France, Germany, Greece, Italy, Netherlands, Norway, Spain, Sweden and the United Kingdom): “The aim of the EPIC study is to investigate the relationships between diet, lifestyle and environmental factors and the incidence of cancer, cardiovascular and other chronic diseases. Preliminary results suggest that vegetarians follow diets that generally correspond well with guidelines for healthy eating and confer some benefits in terms of avoiding obesity and hypertension. Whether these benefits will translate into lower mortality compared with the non-vegetarians remains to be seen”. The first important data of EPIC were published (4, 10, 12, 16–18).

Conclusion

It is not easy to evaluate vegetarianism because of its non-homogeneity. Semivegetarians consume great amounts of vegetables and fruit together with dairy product, eggs and fish. Such diet could be recommended to all because it is nutritionally complete. On the other side, vegan diet could be deficient, e.g. for long-chain polyunsaturated n-3 fatty acids, calcium and vitamins B2 and B12. Simple comparison of health status of vegetarians

with the general population is misleading because much difference is attributable to non-dietary lifestyle factors such as the avoidance of smoking and a higher socio-economic status of vegetarians. Surprisingly, only few studies were conducted on vegetarian longevity and only small difference was found between vegetarians and “health-conscious” non-vegetarians. Vegetarians have a moderately lower IHD mortality than the nonvegetarians but there is no significant difference in mortality from all other major causes of death, e.g. from colorectal, stomach, lung, prostate or breast cancers. There are at least four factors causing a moderately lower vegetarian IHD mortality: lower cholesterol, lower prevalence of obesity, slightly lower blood pressure and higher antioxidant status caused by high consumption of vegetables and fruits. It is the abundant consumption of fruits and vegetables, not the exclusion of meat that makes vegetarianism healthful.

At the end, some sentences of an excellent paper by W.T. Jarvis published on the internet pages of the American Council on Science and Health (<http://www.acsh.org>): “Vegetarians are either *pragmatic* or *ideologic*. A pragmatic vegetarian is one whose dietary behavior stems from objective health considerations (e.g., hypercholesterolemia or obesity). Pragmatic vegetarians are rational rather than emotional, in their approach to making lifestyle decisions. Vegetarianism tends to facilitate weight control because it is a form of food restriction; and in our overfed society, food restriction is a plus unless it entails a deficit of some essential nutrient. In contrast, for *ideologic vegetarians*, vegetarianism is a “matter of principle” by their exaggerations of the benefits of vegetarianism, their lack of skepticism, and their failure to recognize the potential risks even of extreme vegan diets. Ideological promoters of vegetarianism gather data selectively and gear their arguments toward discrediting information that is contrary to their dogma.”

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