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ANIMAL PRODUCTS FOR BETTER HUMAN HEALTH AND NUTRITION

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Introduction

Meat is excellent source of proteins with high biological value. The proteins from meat are of high quality because they contain high share of essential amino acids which are necessary for human. Polyunsaturated fatty acids, especially those from ω3 group, became very important to human nutritionists because they have significant role in prevention of stress induced diseases and of those induced by improper diets. New findings from western industrial countries point out the fact that longer intake of LA (ω -6) with relative "deficiency" of ω-3 is the main risk factor in occurrence of cancer, coronary diseases (CHD), cerebrovascular diseases (CVD) and allergic hyperactivity; not cholesterol as was considered till now. Therefore it is important to reduce the ω-6 / ω-3 acids ratio in meat and milk using some feedstuffs in diets of animals. Dairy products contribute to health throughout life. Epidemiological researches as well as studies in animals and humans indicate that dairy food and/or their components have a protective effect against cancer. The potential anticancer agents identified so far in dairy foods include conjugated linoleic acid (CLA), calcium, vitamin D, sphingomyelin, butyric acid, ether lipids, protein and lactic acid bacteria. Milk is exclusive source of nutrients for the young and it also represents a high grade source of dietary nitrogen and indispensable amino acids for adults. Consumers are increasing looking for animal products, which could prevent disease or illness.

Meat in human nutrition

Meat is excellent source of proteins with high biological value. The proteins from meat are of high quality because they contain high share of essential amino acids which are necessary for human organism. Meat is also significant source of water soluble vitamins from B complex; pork contain 5-10 times more thiamine than other meats. It contains significant amounts of riboflavin, niacin, folic and pantothenic acids, vitamins B6 and B12 which are also essential for humans. In smaller amounts it contains vitamins A, C, D, E and K, and significant

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quantities of iron, zinc and phosphorus. Although muscle tissue contains only 2-3% of fat, depending on the species of the animal and anatomical location, the composition of the fat i.e. content of some fatty acids and their influence on health has become the subject of study of many authors. Market has great influence on producers; it forces them to turn their orientation on complex technological processes. Technologies for production of so called "designed" food are investigated because they, beside already known quality, suit better for human health by stimulation of functional processes in organism. Taste and juiciness' are important properties of meat for consumers and they are in positive correlation with fat content in meat. The demands of producers today go in the direction of lowering the fats with simultaneous modification of some fatty acids in meat.

Although chicken meat is considered as dietetic product, technologies which alter its nutritive composition in direction of reducing the cholesterol level and increasing the content of essential fatty acids are developing today which should give positive impact on human health. Polyunsaturated fatty acids, especially those from ω 3 group, became very important to human nutritionists because they have significant role in prevention of stress induced diseases and of those induced by improper diets (Barlow and Pike, 1991; Albrecht and Klein, 1995). Unsaturated ω 3 type fatty acids decrease the risk of heart diseases and psoriasis; moreover, they are necessary for normal development of brain and nerve tissue (Leaf and Weber, 1988; Barlow and Pike, 1991). Altering the fat composition in broiler diets by inclusion of some feedstuffs results in so called "designed" food, rich in ω 3 polyunsaturated fatty acids such as α-linolenic (C 18:3), eicosapentaenoic (C 20:5) and docosahexaenoic (C 22:6) (Haumann, 1993). Plant sources of fats, rich in ω 3 fatty acids are added into diets for broilers in order to improve the fatty acids profile in the meat and eggs with satisfactory flavor of the product (Chanmugam *et al*., 1992; Ajuyah *et al*., 1993). The possibilities of increasing the α-linolenic fatty acid using the linseed, cumbu, fish meal products (Zollitsch *et al*., 1993; Lettner and Zollitsch, 1993; Kralik *et al*., 1997; Lopez-Ferrer *et al*., 1997). Linoleic acid, LA (C 18:2 ω 6) and α-linolenic (αLNA) are not synthesized in higher animals but in plants. In metabolism of linoleic acid, the chain is desaturated and elongated till α-linolenic acid and arachidonic acid, (C 20:4 ω 6), while αLNA is metabolized till eicosapentaenoic (EPA) and docosahexaenoic acid (DHA). The possibilities of alteration of acids from ω-6 to ω-3 and vice versa does not exist. For this reason tissues with polyunsaturated fatty acids vary a lot regarding the composition (ω-6/ω-3 ratio) depending on the selection of feedstuffs in the diet. Omega-6 /ω -3 ratio in fatty tissue influence many aspects in physiology of animals including

behaviour and health status. Consequently, there is an influence on human health as well. New findings from western industrial countries point out the fact that longer intake of LA (ω -6) with relative "deficiency" of ω -3 is the main risk factor in occurrence of cancer, coronary diseases (CHD), cerebrovascular diseases (CVD) and allergic hyperactivity; not cholesterol as was considered till now. Therefore it is important to reduce the ω-6/ω-3 acids ratio in meat and milk using some feedstuffs in diets (Okuyama and Ikemoto, 1999).

The importance of dairy foods in health and diet:

Dairy products contribute to health throughout life. For children dairy food, in-between a wide variety of foods is nutrient dense food with good amounts of proteins, vitamins and minerals necessary for growth and development. Many studies indicate that intake of calcium rich foods such as all dairy products during childhood and adolescence is an important determinant of peak bone mass and future risk of osteoporosis. Today osteoporosis is a major public health problem in many countries. This disease is responsible for millions and millions fractures a year, including spine, hip, wrist and other sites. Moreover, many older patients with osteoporosis hip fractures fail to regain their former engineered for added value (Harlander, 1998).

Dairy food can make a significant contribution to the nation's supply of nutrients. In Home Economics Research Report by Gerrior and Bente (1997), dairy foods (excluding butter) contributed only 9% of the total calories available. Yet, these foods provides 73% of the calcium, 31% of the riboflavin, 33% of the phosphorous, 19% of the proteins, 16% of the magnesium, 21% of the vitamin B12, 17% of the vitamin A, 10% of vitamin B6 and 6% of the thiamine. Milk and dairy foods are therefore nutrient dense food, supplying a high concentration of much mobility.

Milk, particularly casein, has been demonstrated to decrease the adherence of cavity canting bacteria to the teeth. Researchers have demonstrated an anti-carcinogenic effect of aged Cheddar, Swiss, Edam, Gouda, Mozzarella, Roquefort, Tilzit, Menster, Port Salut, Roman, Stilton, Monterey Jack and American processed cheese (U. S. Department of Health and Human Service, 1996; Jenkins, 1990; Bowen and Pearoon, 1993). Adolescent period is characterized by rapid physical growth as well as maturational changes. Fleming and Heimbach (1994) compared the nutrient profiles of teenage girls who drank milk to those who did not. Milk drinkers consumed 80% more calcium, 59% more vitamin B12, 56% more riboflavin, 38% more folate, 35% more vitamin A, 24% more of each vitamin B6 and potassium and 22% more magnesium than non-milk drinking teenagers. The main

characteristic of that age is lack of knowledge, eating away from home, soft drinks substituted for milk, body image / weight concerns.

Adults – the main characteristic of that age is stability, but a prolonged low calcium intake has been linked to the development of several chronic diseases, including osteoporosis, hypertension and cancer (Fleming and Heimbach, 1994; Heaney *et al*., 1994; McCarron *et al*., 1990). Number of risk factors for osteoporosis have been identified, but both genetics and environmental lifestyle factors influence developing of this disease (Christiansen, 1993; Melton et al, 1992; Norris, 1992).

Gender, race, age, hormonal status and body frame/weight are other factors that influence bone mass and the development of osteoporosis. Women, because of generally smaller, lighter bones, rapid loss of bone at menopause and lower calcium intake are about four times more likely to develop osteoporosis than are men (Matkovic *et al*., 1993).

There are many research papers where authors suggest milk intake to postmenopausal women, because of beneficial effect on bone health (Laccy *et al*., 1991; Callegari, 1990; Hu, 1993). Chronic calcium deficiency may lead to hypertension (McCarron, 1980). After that many trials and papers presents explanation what happened in restricted calcium intake. Two meta analysts found calcium to be significantly effective in reducing blood pressure in normotensive and hypertensive individuals and in preventing induced hypertension and preeclampsia (Sowers *et al*., 1991; Bucher *et al*., 1996).

Colon cancer in susceptible persons may also be the unfortunate results of adaptation to a low calcium intake. On a high calcium diet much of the unabsorbed calcium (75–85 %) remains in the intestinal lumen where it forms insoluble complex with the bile acids and unabsorbed fatty acids, and protects the mucosal lining of the colon from their toxic effects.

On low calcium diet, the body adapts by increasing calcium absorption, leaning less unabsorbed calcium reaching the colon to complex with irritant acids. This increases the likelihood that the cells living the colon will be damaged, proliferate and progress toward cancer.

Epidemiological researches in animals and humans indicate that dairy food and/or their components have a protective effect against cancer. The potential anticancer agents identified so far in dairy foods include conjugated linoleic acid (CLA), calcium, vitamin D, sphingomyelin, butyric acid, ether lipids, protein and lactic acid bacteria (National Dairy Council, 1997).

Milk is exclusive source of nutrients for the young and it also represents a high grade source of dietary nitrogen and indispensable amino acids for adults. A physiological role has also been proposed for milk protein component. Milk components including lactoferrin, vitamin B12 binding protein, folate binding protein, β-lactoglobulin, α-lactoalbumin and casein phosphopeptides are assumed to interact with either minerals and vitamins absorption.

Imunoglobulins, enzymes (lysozyme, lactoperoxidase) and other proteins or derived peptides can also contribute to provide passive protection against infection by a growth or inhibiting activity on bacterial strains and by an antiviral effect. Some casein derived peptide have been identified as angiotensin converting enzyme (ACE) inhibitors that could result in an anti-hypertensive effect. Peptides from Ќ-casein and human lactoferrin could have anti-thrombotic properties (Jolles *et al*., 1986).

Milk and milk products is essential for developing dairy ingredients or products with immunomodulatory (immunoenhancing, immunosuppressive, or anti-inflammatory) properties for human consumption (Gill *et al.*, 1998). On the other hand "bioavailability" in dairy products is very important for supporting normal growth, comparing with the other food sources. But not only in growth phases, also in adult life (Horowick *et al.*, 1987).

Conclusion

Consumers are increasing looking for animal products, which could prevent disease or illness. Future production of that type of products must have reliable scientific nutrition information, so that they do not mislead and that consumers can understand all of them. The place of animal products will be still very important, and subject of many scientific explorations to find real position of them in human well being, and future strategy of public health no risk.

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