UDK 637.1/6.612.39

Izlaganje sa znanstvenog skupa
Conference paper

ANIMAL PRODUCTS IN NUTRITION OF HUMAN POPULATION

Gordana Kralik, Jasmina Lukač Havranek, A. Petričević, I. Jurić

Abstract

In this paper, the significance of animal food (meat and milk) in human nutrition and satisfaction of life needs with special look on health is reviewed. Meat is excelent 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. Polyunsaturated fatty acids, esspecialy 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. 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 occurence of cancer, coronary diseases (CHD), cerebrovascular diseases (CVD) and alergic 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.

Keywords: animal products, polyunsaturated fatty acids, meat, milk, nutrients

---

Rad je priopćen na znanstvenom skupu "8th Int. Symposium – Animal Production and Human Health", Osijek.

Gordana Kralik, Full Professor, Dr.h.c, Antun Petričević, Professor Emeritus - J. J. Strossmayer University of Osijek, Faculty of Agriculture, Trg sv. Trojstva 3, 31000 Osijek, Croatia, Jasmina Havranek Lukač, Full Professor, Ivan Jurić, Full Professor, University of Zagreb, Faculty of Agronomy, Svetošimunska cesta b.b., 10000 Zagreb, Croatia.

Introduction

Human nutrition is up-to-date issue in developed countries as well as in developing countries and countries which are underdeveloped. Food is necessary prerequisite of human survival and the main task of human society is to secure enough food. According to FAO the nutrition of about 800 million people in the world is not satisfactory in quantitative and qualitative sence. The contradictions containted in the background of not having enough food and special requests for biological (nutritional) value of the food should be overcame in near future (Roman declaration, 1996).

Croatia has good conditions for production of significant amounts of food; for its own needs and for export. In this paper, the significance of animal food (meat and milk) in human nutrition and satisfaction of life needs with special look on health is reviewed.

Meat in human nutrition

Meat is excelent 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 tiamine than other meats. It contains significant amounts of riboflavine, niacine, folic and panthotenic 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 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.

The consumption of fresh meat per member of household in 1998 (table 1) was 45.10 kg; processed meat 15.88 kg (dried, smoked, cured as well as conserved and processed meat). The most consumed meat per member of the household is poultry meat (17.78 kg), than follow pork (13.45 kg) and beef (11.59 kg). The comparison of fresh meat consumption per household member in 1988 and 1998 shows that in 10 year period there were 3.2 index points decrease in consumption of all kinds of meat: beef 12.2; pork 19; sheep, lamb and goat 37; organs 3 index points, but poltry meat consumption increased for 26.1 index points. The decrease of standard in Croatia was factor influencing the increase of consumption of cheaper poultry meat.

Table 1. - MEAT AND PROCESSED MEAT CONSUMPTION IN HOUSEHOLDS 1988 AND 1998 IN REPUBLIC OF CROATIA - ANNUAL MEAN PER HOUSEHOLD MEMBER

Meat and meat products	1988		1998		Index 1998/1988
	kg	%	kg	%	
Fresh meat – Total	46.60	100.00	45.10	100.00	96.8
Beef	13.20	28.33	11.59	25.70	87.8
Pork	16.60	35.62	13.45	29.82	81.0
Sheep, lamb, goat meat	1.00	2.15	0.63	1.40	63.0
Poultry meat	14.10	30.26	17.78	39.42	126.1
Other meats and organs	1.70	3.65	1.65	3.66	97.0

Source: SGH, 1989 and SLJH, 1999

In the nutrition structure of a household in 1998, meat and processed meat take part with 13.66%, fish and processed fish 0.84%, milk, processed milk and eggs 9.43%, oils and fats 16.39% and weat products 34.07%. Daily energy consumption per household member is 12,604.71 joule.

Analysis of biochemical composition of household nutrition in 1998 shows that animal proteins make 49.08% from total of daily consumed proteins (table 2).

Table 2. - BIOCHEMICAL COMPOSITION OF NUTRITION IN HOUSEHOLDS IN 1998

Nutritional ingredient	Daily consumption, g	Structure of the composition, %
Carbohydrates	370.80	62.75
Fats	126.74	21.45
Proteins	93.39	15.80
- from this of animal origin	45.84	49.08
Total	590.93	100.00

Source: SGH, 1989 and SLJH, 1999

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 juicyness 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, esspecialy 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 (Barlow and Pike, 1991; Albrecht and Klein,1995). Unsaturated ω3 type fatty acids decrease the risk of heart diseases and psoryasis; 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 ω3 polyunsaturated fatty acids such as α-linolenic (C 18:3ω3), eicosapentaenic (C 20:5ω3) and docosahexaenic (C 22:6ω3), stated Haumann (1993).

Plant sources of fats, rich in ω3 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 rape products have been acknowledged in researches of Zollitsch et al. (1993), Lettner and Zollitsch (1993), Kralik et al. (1997) and Lopez-Ferrer et al. (1997).

Linolic acid, LA (C 18:2ω6) and α-linolenic (aLNA) are not synthetised in higher animals but in plants. In metabolism of linolic acid, the chain is desaturated and elongated till m-linolenic acid and arachidonic acid, AA (C 20:4ω6), while aLNA is metabolised till eicosapentaenic (EPA) and docosahexaenic 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 occurence of cancer, coronary diseases (CHD), cerebrovascular diseases (CVD) and alergic 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, according to the American Academy of Paediatrics (AAP), 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.

Total milk and milk products consumption in analysed period (Table 3) was increased for 3,1 index points; cheese and other products increased for 96,2 index points and fresh milk decreased for 2,1 index points.

Table 3. - MILK AND MILK PRODUCTS CONSUMPTION IN HOUSEHOLDS 1988 AND 1998 IN REPUBLIC OF CROATIA - ANNUAL MEAN VALUE PER HOUSEHOLD MEMBER

Milk and milk products	1988		1998		Index
	Kg or l	%	kg or l	%	1998/1988
Total	110.6	100.0	114.0	100.0	103.1
Fresh milk	97.9	88.5	91.9	80.6	93.9
Butter	0.4	0.4	0.4	0.4	100.0
Cheese and other products	12.3	11.1	21.7	19.0	196.2

Source: SGH - 1989 and SLJH, 1999

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 carity cansing bacteria to the teeth. Researchers have demonstrated an anti-cariogenic 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 characterised 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).

In 1980, McCarron and colleagues hypothesised that chronic calcium deficiency may lead to hypertension. 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; 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 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 (National Dairy Council,1997).

Halt et al. (1998) made a controlled trial to evaluate whether increasing the intake of low-fat dairy foods in patients at high risk of colon cancer would normalise changes in the colon believed to be pre-cancerous (Halt et al. 1998). The trial found out (established) that significantly reduced cell proliferation of the colon mucosa, cell differentiation and maturation was significantly return toward normal. The authors do not attribute these results to calcium alone. Calcium or any of dairy food components, first mentioned, could have produced the positive effect. Since the sequel of calcium deficiency appear to rise of several chronic disease, and several components of dairy food are potentially protective, it makes sense for health practitioners to encourages a lifelong adequate intake of milk and milk products. There is a suggestive evidence that intake of culture containing dairy foods such as yoghurt may protect against colon cancer also more research is needed to confirm this finding as well as to delineate the potential anti-cancerogenic role of CLA. Dairy foods are an important source of calcium, vitamin D, and CLA and if cultured, bacterial cultures, all of which have been suggested to protect against colon cancer. Individuals, especially those at risk of colon cancer, should consume the recommended number of servings from milk and other food groups each day.

There are some more information in research work about milk and milk products. One of those is very important nutritional and physiological role of milk protein components.

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 peptides have been identified as angiotesin-converting enzyme (ACE) inhibitors that could result in an anti-

hypertensive effect. Peptides from κ-casein and human lactoferrin could have anti-trombotic properties (Jolles et al. 1986).

Like a special subject interest can also be many other components of milk and milk products. Great interest can be how milk components act on the immune system.

Detailed information on these is essential for developing dairy ingredients or products with immunomodulatory (immunoenhancing, immunosuppressive, or anti-inflam- matory) properties for human consumption (Gill et al. 1998). On the other hand "bioviability" 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, 198T).

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 exploration to find real position of them in human well being, and future strategy of public health no risk.

REFERENCES

1. Albrecht, M., M. Klein (1995): Oleum Lini: Portrait eines pflanzlichen Oels. Pharmazie 7, 36-40.
2. Ajuyah, A. O., R. T. Hardin, J. S. Sim (1993): Studies on canola seed in turkey grower diet: Effects on ω3 fatty acid composition of breast meat, breast skin and selected organs. Can. J. Anim.Sci. 73:177-181.
3. Barlow, S., I. M. Pike (1991): Humans, animals benefit from omega 3 polyunsaturated fatty acids. Feedstuffs 63 (19): 18-26.
4. Bowen, W. H., S. K. Pearoon (1993): Effect of milk on cariogenesis, Caries Res., 27:461.
5. Bucher, H. C., R. J. Cook, G. H. Guyatt, J. D. Lang, D. J. Cook, R. Hatala, D. L. Hunt (1996): Effects of dietary calcium supplementation on blood pressure, JAMA, 275 (3):1016.
6. Bucher, H. C., R. J. Cook, G. H. Guyatt, J. D. Lang, D. J. Cook, R. Hatala, D. L. Hunt (1996): Effects of dietary calcium supplementation on blood pressure, JAMA, 275 (14):1113.
7. Callegari, C., F. Lami, F. Levantesi, A. M. Andreacchio, M. Tatali, M. Miglioli, S. Gnuki, L. Barbari (1990): Post menopausal bone density, lactase deficiency and milk consumption, J. Hum. Nutr. Dietetics, 3: 159.

8. Chanmugam, P., M. Boudreau, T. Boutte, R. S. Park, J. Hebert, L. Berrio, D. W. Hwang (1992): Incorporation of different types of n-3 fatty acids into tissue lipids of poultry: Poultry Science. 71: 516-521.
9. Christiansen, C. (1993): Skeletal osteoporosis, J. Bone Miner Res., 8 (suppl. 2): 475.
10. Fleming, K. H., J. T. Heimbach (1994): Consumption of Calcium in the U. S.: food sources and intake levels, J. Nutr. 124: 1426.
11. Gerrior, S., L. Bente (1997): Food Supply, 1909-1994, Nutrient Content of the U. S. Home Economics Research Report, No. 53, U. S. Department of Agriculture Centre for Nutrition Policy and Promotion.
12. Gualtiery M., B. Pali, B., Rapaccini (1993): Fatty acid composition of broilers meat as influenced by diet supplementation with fishoil. In 11th European Symposium on the Quality of Poultry Meat. Tours, 4-8 October, Vol.1:136-141.
13. Gill, H. S., K. J. Rutherfurd (1998): Immunomodulatory properties of bovine milk, Bulletin of IDF 336.
14. Halt, P. R., E. O. Atillasay, J. Gilman, J. Guss, S. F. Mass, H. Newmark, K. Fan, K. Yang, K. and M. Lipkin (1998): Modulation of abnormal colonic epithelial cell proliferation and differentiation by low-fat dairy foods, JAMA, 28 (12):1074.
15. Harlander, S. (1998): Food for 21st Century, Bulletin of the International Dairy Federation No. 336/1998.
16. Haumann, F. B. (1993): Designer eggs already on supermarket shelves. INFORM, 4 (4), 371-373.
17. Heaney, R. P., J. Barger-Lux (1994): Low calcium intake, the culprit in many chronic disease, J. Dairy Sci. 77: 1195.
18. Horowick, M., J. Wiskart, L. Mundy, B. E. C. Nardin, B. E. C. (1987): Lactose and calcium absorption in postmenopausal osteoporosis. Arch. Int. Med.147: 534-536.
19. Hu, J. F., J. B. Zhao X-H., Jia, B. Parpia, T. D. Campbell (1993): Dietary calcium and bone density among middle age and elderly women in China, Ane. J. Chin. Nutr. 58: 219.
20. Jenkins, G. N. (1990): Cheese as a Protection against dental caries. Nutr. Q.,13.33.
21. Jolles, P., S. Lery-Toledono, A. M. Fiat, C. Soria, D. Gillesen, A. Thomaidis, F. W. Dunn, J. P. Caen (1986): Analogy between fibrinogen and casein. Effect of an undecapeptide isolated from κ-casein on platelet function. Eur. J. Biochem. 158: 379-382.
22. Kralik, Gordana, P. Božičković, Galonja, Marica, Z. Škrtić, Canecki, Katica (1997.): Mogućnost povećanja sadržaja višestruko nezasićenih masnih kiselina u pilećem mesu putem hranidbe. Krmiva 39 (5): 223-231.
23. Laccy, J. M., J. J. Anderson, T. Fujita, Y. Yoshimato, M. Fukase, S. Tsuchie, S. and G. G. Koch (1991): Correlates of cortical bone mass among pre-menopausal and post-menopausal Japanese women, J. Bone Miner. Res., 6:651.
24. Leaf, A., P. C. Weber (1988): Cardiovascular effects of ω3-fatty acids.N.engl.J.med. 318:549.
25. Lettner, F., W. Zollitsch (1993): Ersatz von Sojaoel durch Rapsoel im Huehnermastfutter. Voerderungdienst 41 (3), 69-72.
26. Lopez-Ferrer, S., M. D. Baucells, A. C. Barroeta, A. Blanch, M. A. Grashorn (1997): ω3 Enrichment of Chicken Meat: Use of Fish, Rapeseed and Linseed

Oils. Poultry Meat Quality. Proceedings of the XII European Symposium on the Quality of Poultry Meat, September 21-26, Poznan, Poland, 74-82.

27. Matkovic, V., J. Ilich and L. Hsich (1993): Influence of age, sex and diet on bone mass and fracture rate, Osteop. Int., Suppl. 1: 20.
28. McCarron, D. A., P. A. Pingree, R. J. Rubin, S. M. Gancher, M. Malitch, S. Krutzik (1980): Enhanced parathyroid: a homeostatic response to a urinary calcium leak, Hypertension, 2: 162.
29. McCarron, D. A., M. Lipkin, R. S. Rivlin, R. P. Haney (1990): Dietary calcium and chronic diseases, Med. Hypath., 31: 265.
30. Melton, L. J., E. A. Chriscilles, C. Cooper, A. W. Lane, B. L. Riggs (1992): Pespectice. How many women have osteoporosis? J. bone Miner. Res. 7 : 1005.
31. Norris, R. J. (1992): Medical costs of osteoporosis, Bone, 13, S11.
32. Okuyama H., A. Ikemoto (1999): Needs to modified the fatty acid of meats for human health. Proceedings of 45 ICoMST, Yokohama, Japan, P. 638-639.
33. Petričević, A., R. Božac (1991.): Mogućnosti i razvoj proizvodnje tehnološki kvalitetnog i zdravog mesa. Poljoprivredne aktualnosti, 39(3-4):685-690.
34. Sowers, J. R., M. B. Zemel, P. C. Zemel, R. P. Standley (1991): Calcium metabolism and dietary calcium in salt sensitive hypertension, J. Am. Hypertension, 4: 557.
35. Zollitsch, W., W. Wetscherek, F. Lettner (1993): Einsatz von Rapsoel im Huehnermastfutter. Archiv für Geflügelkunde, 56 (4), 182-186.
36. ..... Statistički godišnjak Hrvatske, 1989. god.
37. ..... U. S. Department of Agriculture and U. S. Department of Health and Human Service, Nutrition and Your Health: Dietary Guidelines for Americans, 4th ed. Home and Garden Bulletin No. 323, Washington D. C. USDA/DHHS 1995.
38. ..... U. S. Department of Health and Human Service, Public Health Service, Healthy People 2000, 1995-1996, DHHS Publ. No. (PHS) 96-1256, Hyattsrille, M. D., November 1996.
39. ..... International Dairy Food Association, Cheese Facts 1997, Edition, Washington D. C.-a.
40. ..... National Dairy Council, New perspective on diet and cancer, Dairy Council Digest, Sep./Oct. 1997.
41. ..... Council for Agricultural Science and Technology (CAST). Contribution of Animal Products to Healthful Diets, Task Force Report. 131, Ames, Iowa, October 1997.
42. ..... American Association of Paediatrics, Committee on Nutrition, Paediatric Nutrition Handbook, 4th Ed. American Academy of Paediatrics, Elk Grove Village, IL 1998.
43. ..... Statistički ljetopis Hrvatske, 1999. god.

ŽIVOTINJSKI PROIZVODI U PREHRANI LJUDI

Sažetak

U ovom se radu ispituje važnost životinjske hrane (meso, mlijeko) u prehrani ljudi i zadovoljavanju životnih potreba s posebnim osvrtom na zdravlje. Meso je izvrstan izvor bjelančevina visoke biološke vrijednosti. Bjelančevine u mesu su visoke kakvoće jer sadrže veliki

udio esencijalnih aminokiselina, potrebnih ljudskom organizmu. Polinezasićene masne kiseline, osobito one iz skupine ω-3, postale su vrlo važne stručnjacima za ishranu ljudi, jer imaju značajnu ulogu u preventivi/sprječavanju bolesti izazvanih stresom i neispravnom prehranom. Nova otkrića u zapadnim industrijskim zemljama ističu činjenicu da je dulje uzimanje LA (ω-6) s odnosnim "nedostatkom" ω-3 glavni čimbenik rizika pojave raka, koronarnih bolesti (CHD), cerebrovaskularnih bolesti (CVD) i alergijske hiperaktivnosti; ne kolesterol, kako se do sada smatralo. Stoga je važno smanjiti ω-6/ω-3 omjer kiselina u mesu i mlijeku upotrebom nekih krmiva u prehrani životinja. Mliječni proizvodi pridonose zdravlju tijekom života. Epidemiološka istraživanja kao i istraživanja na ljudima i životinjama pokazuju da mliječna hrana i/ili njihovi sastavni dijelovi imaju zaštitno djelovanje protiv raka. Do sada identificirana antikancerozna sredstva u mliječnoj hrani uključuju vezanu linoličnu kiselinu (CLA), kalcij, vitamin D, svingomijelin, maslačnu kiselinu, eterične lipide, bjelančevine i bakterije mliječne kiseline. Mlijeko je isključiv izvor hranjivih tvari za mlade a isto tako predstavlja izvor dijetalnog dušika visoke kakvoće i aminokiseline prijeko potrebne odraslima. Potrošači sve više traže proizvode životinja koji mogu spriječiti oboljenja i bolesti.

Ključne riječi: životinjski proizvodi, polinezasićene masne kiseline, meso, mlijeko, hranjive tvari

Primljeno: 10. 10. 2000.