SCIENTIFIC-APPLIED SIGNIFICANCE OF FUNCTIONAL FOODS IN REGULATION OF MAIN METABOLITIC PROCESSES

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Abstract

Healthy eating meets the metabolic needs of the body, ensures good health and active life longevity. The modern concept of nutrition is oriented not only to adequate but also to optimal intake of macro- and micronutrients. Nutritional imbalances (both deficiencies and surpluses) are an indisputable etiological factor for a number of chronic non-infectious diseases - cardiovascular, metabolic, cancerous, osteoporosis and others.

The present work is to perform a specialized analysis and discussion of the scientific and applied significance of functional foods in the regulation of basic metabolic processes.

The main importance in a balanced diet are the so-called. functional foods - one of the new directions in the science of nutrition. There are many definitions that mark the term. The most common is: "Food that satisfactorily demonstrates beneficial effects in terms of one or more target functions in the body, beyond adequate nutritional effects, as well as affecting improved health status or reducing the health risk of developing the disease."

Functional foods and nutritional supplements are expected to help balance the food model in developed countries. It is indisputable, however, that a natural diet cannot be replaced by any extracts and functional components, as food is not only a means of satisfying physiological needs, but also one of the greatest human pleasures.

Key words: *functional foods, food model, physiological needs, metabolic processes.*

Introduction

Healthy eating meets the metabolic needs of the body, ensures good health and active longevity. The modern concept of nutrition is oriented not only to adequate but also to optimal intake of macro- and micronutrients. Nutritional imbalances (both deficiencies and surpluses) are an indisputable etiological factor for a number of chronic non-infectious diseases - cardiovascular, metabolic, cancerous, osteoporosis and others.

The aim of the present work is to perform a specialized analysis and discussion of the scientific and applied significance of functional foods in the regulation of basic metabolic processes.

Materials and Methods - review of scientific scientific data, sociological methods.

Results and Discussion

Basic in a balanced diet are the so-called. functional foods - one of the new directions in the science of nutrition. There are many definitions that mark the term. The most common is: "Food that satisfactorily demonstrates beneficial effects in terms of one or more target functions in the body, beyond adequate nutritional effects, as well as affecting improved health status or reducing the health risk of developing the disease." Most importantly, functional foods improve the physiological functions of various organs and systems and through this function reduce the risk of disease, (1,2,3).

Functional components with lipotropic action, which improve the work of the liver parenchyma and reduce the risk of excessive deposition of fat in the liver and accelerate its detoxification, (1,3).

Choline, isonitol and methionine are biologically active substances contained in lipotropic formulas. They help liver function to deal with excess fat by catalyzing lipolysis, helping to reduce overweight and obesity.

Bromelain is a potent proteolytic enzyme of plant origin. It is found naturally in the fruits and stems of the pineapple, so it is also called pineapple extract. In fact, bromelain is a complex substance in which enzymes responsible for the breakdown and absorption of proteins from the food consumed predominate. Improves protein, carbohydrate and fat metabolism.

Vitamin F (a complex of unsaturated fatty acids - linoleic, linolenic and arachidonic fatty acids) helps to reduce body weight by activating the burning of excess tissue fat. Contained in linseed oil, sunflower, saffron oil, sunflower seeds, almonds, avocados.

Thunderbolt - the herbal plant used in folk medicine for centuries, the first scientific studies on its antioxidant properties were published in 2015. Its functional effects are associated with the activation of diuresis. Used in dietary detoxification regimens.

Aloe vera juice improves digestion and cleanses the gastrointestinal tract. Cardamom, hot peppers, cinnamon, ginger have a thermogenic effect, improve digestion and fat metabolism.

Garcinia Cambogia is an effective means of suppressing fatty degeneration of the liver, helps burn fat and suppress appetite.

Fennel promotes the excretion of mucus and food residues in the course of the gastrointestinal tract and suppresses appetite.

Fenugreek has a beneficial effect on fatty infiltration of the liver.

The amino acid arginine helps regulate weight by activating the breakdown of subcutaneous fat at the expense of synthesizing muscle mass. Contained in carob, chocolate, dairy products, coconuts, gelatin, meat, oats, soy, walnuts.

Tryptophan is an essential amino acid that helps control weight by reducing appetite. Contained in brown rice, cottage cheese, meat, peanuts, soy.

The functional component Phaseolamin, derived from legumes and cereals, is a specific inhibitor (suppressor factor) of the enzyme alpha-amylase, secreted by the pancreas and responsible for the breakdown of starch into glucose. Its presence is associated with the inability of starch (polysaccharide) to be broken down into glucose and fructose (monosaccharides). Undigested starch is excreted in the faecal mass, preventing the passage of monosaccharides into the bloodstream.

The functional components with antioxidant action - polyphenols are present in green tea and in various herbal plants, fruits, vegetables and more. Accelerate the metabolism of proteins, fats and carbohydrates, including the burning of fat depots, (4,5).

Functional component caffeine contained in green tea, coffee, guarana, cola-based drinks. Stimulates the release of norepinephrine from the adrenal glands, which in turn suppresses the center of hunger in the hypothalamus. Stimulates thermogenesis - the production of energy from digested and assimilated food and the burning of free fatty acids from landfills for energy consumption. It has a diuretic effect.

Functional component orlistat suppresses hunger. Inhibits the absorption, respectively increases the excretion of fat at the level of the gastrointestinal tract.(6)

Dietary fiber has the ability to swell in the gastrointestinal tract and create a feeling of satiety. They activate intestinal peristalsis and the emission of energy components from the consumed food - glucose, fats, cholesterol. Over 85% of overweight and obese people develop type II diabetes, in

which cells do not respond or respond poorly to endogenously synthesized insulin from the pancreas. Important in this case is the control over the absorption of rapidly absorbed sugars (in the direction of reduction) from food with the help of dietary fiber.

Potassium from plant sources (apricots, pumpkin, lentils, etc.) has a diuretic effect and has an alkalizing effect.

Chromium inhibits the transformation of sugars into fats and improves glucose tolerance.

In our country, experts and consumers highly appreciate the beneficial metabolic effects of two groups of fruit-based products - fruit nectars and fruit purees, whose antioxidant composition adequately defines them as functional foods (Table 1 and Table 2).

Antioxidant activity was determined by the Oxygen Radical Absorbance Capacity (ORAC) method.

It is seen that a wealth of antioxidants is contained in chokeberry, as well as in the fruits of blackcurrant, elderberry, bilberry, blackberry. Chokeberry fruits have the highest antioxidant activity and it has been found that their intake in diabetics lowers blood sugar by 10 to 30%.

Conclusion

There is no doubt that functional foods generate some of the most promising and dynamically developing branches of the food industry. The dynamic lifestyle and work of modern man has led to an extreme increase in the relative share of the so-called. "Fast" foods - affordable and tasty - high in calories, but with negligible content of essential nutrients and biologically active substances, which has a negative impact on the health status of the population globally and in our country. Functional foods and nutritional supplements are expected to help balance the food model in developed countries. It is indisputable, however, that a natural diet cannot be replaced by any extracts and functional components, as food is not only a means of satisfying physiological needs, but also one of the greatest human pleasures.

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Table 1. Content of anthocyanins, polyphenols and ORAC in fruit nectars

Products rich in antioxidants	**Anthocyanins mg/l**	**Polyphenols mg/l**	**ORAC µmol TE/l**
ARONIA juice with added fructose	545,2	2934	42188
ARONIA nectar without sugar	260,1	1571	24253
BLACKBERRY nectar without sugar	220,1	1280	21470
Strawberry nectar without sugar	173,2	1030	18523
Raspberry nectar without sugar	34,3	522	8026
CASIS nectar without sugar	94,2	1119	1119

Table 2. Content of polyphenols and ORAC in fruit purees

Kind of puree	**Polyphenols mg GAE / 100 g**	**ORAC µmol TE / g**
Cornus mas	512,16	55,78
Aronia	1130,76	153,47
Strawberry	214,40	44,48
Black currant	528,37	61,35
Blackberry	379,43	65,31
Raspberries	240,09	30,29