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NEW INDICATORS OF FOOD QUALITY/SAFETY

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The article is mainly devoted to the proposal of the new indicators of food quality. There are presented certain philosophical considerations connected with food quality and safety. Food safety is discussed in relation to the natural and genetically modified raw materials used for its production. There are also presented the principles of the old and new nutritional pyramids. However, the main problem is concentrated on the proposal of the new indicators of food quality. Four new indicators of food quality are presented: opioid activity, antioxidative activity, allergic activity and sensory activity. The idea of this conception is explained on the example of the opioid activity of milk and milk products. The conclusion is that the evaluation of food quality/safety should concern also components with specific biological activity.

INTRODUCTION

The term "Food Safety" dates back to the end of the XXth century. It has different semantic meanings, as it contains philosophical ideas, current nutritional conception and practically all knowledge about food. The food safety should guarantee not only physical health to humans but also their intellectual development. On the other hand, the production of food can not cause unfavourable changes to the natural ecosystems of our Planet. The production of safe food struggles also with the immemorial problem of the hunger. Apart from the above-mentioned problems, it can be ascertained that the progress in the production of safe food allows an optimistic look ahead.

PHILOSOPHICAL CONSIDERATION

The impressive advance in science and technology observed in the last century verified some outlook upon life. For the first time, humans have created a real vision of extermination of the human population. This catastrophy could happen as a result of nuclear, chemical and biological war. A part of the human population is dying and will die of starvation. For this reason, we should interrogate about the food safety in the various aspects. The motto of the presented questions is the Horatius maxim – "Hunger stomach seldom despises the vulgar fare (food)". The interpretations of this maxim provoked us to formulate three questions:

1. What is more important for the poor and hungry man: quantity or quality of food?
2. Do we know all principles of the evaluation of the nutritional ecosystem of the man in the aspect of his physical, mental and cultural development?
3. Is it possible to create the rational politics for the whole glob?

We are leaving these questions unanswered.

NUTRITIONAL PYRAMIDS

Why are there so many different nutritional theories? It is difficult to give one credible answer. But, it can be assumed that one theory is formulated on the solid scientific investigations and other are based on the individual simplified conceptions of the authors. Unfortunately, the nutritional research is also not too precise. The ideal method of the evaluation of the influence of food on the physical and mental condition of the human should take into consideration the principle of the maximum heterogeneity. Different groups of people should be randomly ascribed to a definite diet. Of course, such investigations have to involve a large population of people. However, such research are very expensive and organizationally difficult. This fact causes that the nutritional research is often reduced and the proposed principles of nutrition are too simplified. The nutritional pyramid recommended the evidence of fats and consumption a large amount of food rich diet was to decrease the consumption of saturated fats causing an increase in blood cholesterol. The later investigations proved that the consumption of large amounts of purified sugars (white bread, rice, pastes) can disturb the correct levels of glucose and insulin in blood. The replacement of sugars with unsaturated fats decreases the risk of the heart diseases. For this reason, the dieticians proposed a new nutritional pyramid. This pyramid recommends the consumption of healthy fats (unsaturated) and full-grain products and evidence of the purified sugars, butter and red meat. Still the dieticians recommend the consumption of vegetables and fruits. They suggest a reduced intake of dairy products.

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THE CONCEPT OF FOOD SAFETY (OECD – REPORT FROM 1993)

The concept of food safety should take into consideration both the evolutionary development of the nutritional ecosystem and the progress in genetical modifications of food components. These conditions satisfy the definition of OECD, which sounds: "The safety of food for human consumption is based on the concept that there should be a reasonable certainty that no harm will result from intended uses under the anticipated condition of consumption. Historically foods prepared and used in traditional way have been considered to be safe on the basis of long-term experience, even though they may have contained natural toxicants or antinutritional substances. In principle food has been presumed to be safe unless a significant hazard was identified" [GNE, 1993].

NOVEL FOOD

The novel food area based on plant molecular biology opens up for more nutritious, more tasty, more attractive food with longer shelf life and lower prices for a growing world population, but also warrants attention towards the unintentional introduction for adverse toxic and/or antinutrional effects [Knudsen, 1995]. Can novel food be evaluated by the same methods as traditional foods taking into consideration the specific methods of its production? The question seems to be rhetorical. Really, the assessment of the wholesomeness of novel foods needs to take into account both testing and assessment procedures, which are different from those used traditionally for defined chemicals. This new challenge includes a technological problem, a conceptual problem and an ethical problem. So, the evaluation of food safety of novel food requires the preparation of a new procedure of its evaluation.

CONCEPTION OF NEW INDICATORS OF FOOD QUALITY

In opinion of the authors, food should be treated as a living tissue being the source of the biologically active components. Taking into account this point of view, we propose the following concept of the biological activity of food component in the aspect of proved physiological effect on the human organism. A new indicator of food quality should inform the consumer about the kind and the quality of a biologically active component present in food and its physiological activity. The practical example of the presented concept is the research project PBZ/KBN/P06/1999 (financed by the State Committee for Scientific Research – Poland). The first results are presented in this special issue. Our earlier investigations [Jarmołowska, 1999; Krawczuk, 2000; Kostyra, 2000] suggest that food safety should be evaluated not only with regard to the content of the toxic and antinutritional compounds but also to that of other biologically active ones. For this reason, we included to the criteria of food quality/safety the following new indicators: opioid activity, antioxidative activity, allergic activity and sensory activity. The examples of the compounds representing such kinds of biological activities are: opioids peptides derived from milk proteins, some peptides and phenol-compounds, animal and plant proteins, bitter and astringent peptides and polyphenols, respectively. In the case of the biologically active compounds of food, it is very important to evaluate how much of these compounds is provided for the living organism. The recent trend in supplementation of food creates the danger of overdosing natural components, for example: vitamins and microelements. Such phenomenon can cause unfavourable consequences to health. An interesting example of the biologically active compounds present in food are opioid peptides. As natural components of the human and cow milk, they probably should play the positive physiological function. On the other hand, it is known that some pathophysiological conditions of women and schizophrenia are connected with a higher content of these peptides in their organism [Kostyra *et al*., 2003]. This fact proves that the opioid activity should be one of the criteria of food safety evaluation. The presented preliminary results [Kostyra *et al*., 2003] allow having the hope that a method for the determination of the opioid activity of food will be prepared soon.

GENERAL CONCLUSION

The evaluation of food safety, particularly of the novel food, requires preparation of new analytical methods and procedures. An introduction of additional indicators of food quality/safety will allow the production of a novel food for different age groups of people using natural and modified raw materials.

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