SYSTEMIC APPROACH AND HOLISTIC THINKING IN THE FIELD OF FOOD PRODUCT ENGINEERING

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At present, there are many scientific and technical problems that are solved based on the concept of system. The methodology for applying the system concept presents the systemic approach. This method emerged as a result of profound changes in human society's knowledge of natural processes and the accelerated development of technical progress. The traditional investigation methodology did not allow solving many complex problems in the field of engineering, biotechnology, economic problems.

The system concept allowed to formulate and solve problems at another level of thinking, called *holistic thinking*. In general, the system presents a set of interdependent elements linked together, arranged in a certain order in space and time, with compatible action, in order to achieve a common result or programmed goals.

The methodology of the systemic approach and holistic thinking significantly differs from other traditional approaches, and it is based on the concept that presents the consecutiveness of the activity procedures as follows:

initially, the activity begins with identifying the system, or formulating an idea about the system that needs to be developed;

the next step, the detailed unfolded characteristic of the properties and functions of the integral system is presented:

finally, the structure of the system is presented through the characteristic and function of each element of the system and the links between the elements.

Currently, the systemic approach methodology and holistic thinking present one of the most effective methods used in various fields of human activity: in scientific research, in engineering, medicine, biology, economics, sociology, politics, etc.

In the field of food engineering, three types of systems are known: food systems, biological systems and technical systems; they can be designed, developed, installed, transported, consumed, etc.

All these systems correspond to specific criteria that are not used in other disciplines. For example: ***stakeholders*** are the people who support and are co-interested in the realization of the system; ***holon* and *holarchy*** - characterize the hierarchical structure of the system; ***system architecture*** - characterize the integral properties of the system; ***system life cycle*** - appreciate the duration of the system's existence.

An example, a drinking water packaged in bottle is a simple food system. In this case it is necessary to present: s*takeholders* - who is interested and supports the production of drinking water in bottles; *the hierarchical structure* of bottle with water - water, bottle, cap; the chemical composition of the water, the materials of the bottle and cap, etc. *Architecture* – what kind of water, for which consumers it is intended, the structure and function of the system, the label – the information on the label. *Life cycle* of the system - manufacturing time, water shelf life, etc.

The principles and methods of engineering systems are standardized at an international level: Standard **ISO/IEC15288:2008** "*System life cycle processes*"; **ISO/IEC42010** "*Engineering. Architecture description*"; including Standard of the Republic of Moldova **SM ISO/CEI/IEEE 15288:2015** "Engineering of systems and software. Processes of system life cycle" and others.