

## THE APPLICATION OF HACCP FOR THE DEVELOPMENT OF RISK MANAGEMENT IN THE PRODUCTION OF YOGURT WITH THE ADDITION OF VEGETABLE BY-PRODUCTS

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### Abstract

With the removal of by-products and waste from food production processes, valuable bioactive compounds (vitamins, antioxidants, dyes, etc.) are lost. By recovering and reusing them in a new technological process, in the context of the circular economy, they can solve technological problems that would have required the use of additives that have harmful effects on health and can also give the products the status of functional food. In order to obtain the status of a by-product, according to European legislation, the substances resulting from technological processes must meet food safety conditions, not endanger the health of the population and not negatively affect the environment. This research shows the importance of applying the Hazard Analysis and Critical Control Points (HACCP) in the development of yogurts that have as an addition by-products recovered within the circular economy from vegetable products. The purpose of recovering these by-products is to replace certain additives and they have the role of improving the sensory characteristics and preventing defects in acidic dairy products.

For the recovery of these by-products and waste from the food industry, the legislation in force and the conditions it imposes were taken into account. The by-product resulting from the processing of grapes from the Feteasca Neagra variety (grape purslane) was used in a proportion of 2% in the manufacture of yogurt so its quality to be improved. By analyzing the manufacturing process of this product, the critical control points (CCP) were determined using a decision tree, also corrective measures for possible deviations and plans for tracking and implementing corrective actions were identified.

After making the technological flow diagram and identifying the potential hazards, the severity and probability of occurrence of the hazards was determined. Then the CCP were identified such as: the primary processing of the by-products to adapt to the technological flow and to provide microbiological safety, preservation (when the milk processing plant is provided with a section for the processing of by-products), thermal processing of milk as well as thermosetting and cooling of yogurt. The critical limits for each CCP were identified according to the norms and legislation in force and the corrective actions were proposed for each critical point of the CCP.

The application of the HACCP system ensures good traceability throughout the production process of yogurts with by-product additions. It allows a good follow-up of the critical control points and keeping them under control to ensure safe products for human consumption.

**Key words:** *Yogurt, By-products, Bioactive compounds, HACCP, Risk.*