ABSTRACT

of the PhD thesis with title:

"OPTIMIZATION OF QUALITY CONTROL AND FOOD SAFETY PROCESS IN A STARCH FACTORY"

Key words: starch, quality control, HACCP, optimization, food safety

The starch industry provides a high number of products used as raw materials for food and feed industry and therefore it must focus increasingly more towards the assurance and control of quality and also towards the implementation of the HACCP system. For issuance a system of quality control and food safety, there should be indeed applied the scientific and legal principles, but for the system be effective must be considered especially the specific aspects of each factory.

The PhD thesis with title: **"Optimization of quality control and food safety process in a starch factory"** presents the synthesis of essential steps needed for optimizing the quality control plan and also the HACCP plan, already implemented in a starch factory in Romania. Therefore, the objectives proposed are the following:

- ✓ Based on the information from the literature, to issue a study that highlight the current stage of starch manufacturing technology knowledge and after that to identify the steps which needs to be improved.
- ✓ Realizing some researches regarding the sampling process in the starch industry and elaborate a sampling procedure adapted to the starch factory took as reference.
- ✓ Establish an optimal recording system for the analysis results which could confer safety and rapidity in controlling the production process and in assuring the quality of the products obtained.
- ✓ Optimize the HACCP plan implemented by the factory took as reference by renewing the hazard analysis and identify the new possible CCPs, confirm the one already knew or those became redundant.

The thesis is structured in three parts as follows:

- The first part presents the documentary study and the actual stage of knowledge of the problems approached in the paper and contains the chapters I and II.

- The second part presents the objectives, the materials and the methods used for making the study and it contains the chapter III and IV.
- The third part contains the results obtained from the study and it contains the chapters V, VI and VII.

Chapter I, named **"Current Knowledge Stage of Quality and Food Safety Management Systems"** presents a short history and the actual stage of knowledge at international level for the standards of quality– ISO 9001 and of food safety – ISO 22000, and also the legislative aspects from Romania and Europe and a short comparison with the international legislation.

Chapter II, named **"Current Stage of Knowledge Regarding Starch Production Process and Properties"** presents, in the first part the corn starch obtaining process and presents its characteristics and in the second part presents the actual researches regarding the improvement of corn starch production process and the possibilities to those be applied in a starch factory.

Chapter III presents the objectives of this paper.

Chapter IV, named **"Materials and Methods"** presents in the first part a description of the standards, legislation and specific documents of the starch factory used in the study, of the samples used and also of the location where the experiments took place. In the second part the chapter presents the description of the working methods used during the researches, the analysis methods used to validate and monitor the critical control points and the methods of managing the management system's documents.

Chapter V, named **"Optimization of the Sampling Process in a Starch Factory"** presents in the first part the description of the sampling process and its importance in the process of quality control and food safety and also presents the sampling methods provided by the legislation and standards applicable in the starch industry. In the second part the chapter presents the description of the sampling procedures elaborated for a starch factory taking into consideration the legislative aspects, the standards and the specific and the possibilities of the factory.

Chapter VI, named **"Optimization of the system for recording the analyses results as part of the quality control plans in a starch factory"** presents in the first part the quality control plan used by the laboratory of the starch factory, together with the steps from

the production process and the analysis methods used for its control. On this occasion it was made also a comparison of the analysis methods used by the laboratory with the ISO standardized methods and with the methods used by another two important entities fron starch industry: International Starch Institute (ISI) and Corn Refiners Association (CRA). In the second part is presented the recording system used by the laboratory as it was at the beginning of the researches and the results obtained during and at the end of its optimization.

Chapter VII, named **"Optimization of the HACCP System in a Starch Factory"** presents the HACCP system in the starch factory took as reference and steps followed for its optimization: elaboration of the flow diagrams for starch and for glucose syrup, identification of all microbiological, chemical and physical hazards, elaboration of a HACCP plan and of the results that lead to the validation of the new plan HACCP for starch and glucose syrup and presentation of the results which lead to validation of the new HACCP plan. The results obtained during three years of researches lead to obtaining a HACCP study completed, safety from the food safety point of view, but also efficient, by reducing at minimum the costs.

The conclusions of the thesis are presented separately, at the end of the paper, containing the scientific contribution of the author and the future research directions for the approached theme.

The bibliography is composed by the list of the papers taken from the literature and studied in order to issue the documentary study necessary for the elaboration of the thesis.

The results of the study have shown that for making an efficacious control plan the main step is represented by the sampling process. With this purpose in view, there were developed several sampling procedures for the starch industry that take into consideration the factory specificity including the infrastructure facilities, the activities and the analysis type.

The recording system used by the laboratory to control the production process and the quality of the product was optimized by elaborating an EXCEL files designed to streamline the laboratory activity by reducing the costs and the errors.

The HACCP system already implemented in the factory was revalued and new critical control points were identified. These were validated on this thesis framework through the

reevaluation of the new technologies implemented in some of the production areas, of the scientific evidences and the factory's general possibilities.

The thesis brings original contributions through the specificity and the adaptability of the results, which can be applied easily in the industries with similar profile.

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