

DEVELOPMENT AND IMPLEMENTATION OF HACCP PLAN BASED ON FMEA IN COLLAGEN HYDROLIZATE INDUSTRY

Raushangul Ulangazievna Uazhanova¹, Assemay Talgatkyzy Kazhymurat^{1*}, Ulbala Oblbekovna Tungyshbayeva¹, Alberto Cepeda Saez²

¹Faculty of food production, Almaty Technological University, Furkat, 348/4, A10X7B1
Almaty, Kazakhstan

²Analytical Chemistry, Nutrition and Bromatology Department, University Santiago de Compostela, Praza Pío XII, 3 27001 Lugo, Spain

*e-mail: askazhymurat@gmail.com

Abstract

Collagen is a modern food product and is widely used in the food and beverage industry to improve the elasticity, consistency and stability of products. The aim of the study was to develop and implement a Hazard Analysis Critical Control Point (HACCP) plan based on Failure Modes and Effect Analysis (FMEA) in the hydrolyzed collagen industry.

To ensure safety of collagen hydrolysate, we used the HACCP system as a concept involving the systematic identification, assessment and management of hazards that significantly affect product safety and the FMEA model to identify the types of potential failures, their causes and consequences, and the impact of failures on the functioning of the system in collagen hydrolysate industry.

According to the investigations, we established that the control critical points in the production of collagen hydrolyzate in the particulate establishment are the following steps: processing enzyme preparation - trypsin, processing enzyme preparation - pepsin, and storage, distribution and transportation. Also, temperature, time and medium of the enzyme preparation are directly affecting the yield and quality of the product. These three CCPs were identified in the production of collagen hydrolysate by using the FMEA model. As a result, a draft production program of preliminary and mandatory measures for collagen hydrolysate production, and a HACCP plan based on the FMEA model, have been developed.

HACCP is very similar to the sections of FMEA that are concerned with customer safety and requirements. The FMEA goes further in examining in detail every aspect of customer requirements. HACCP drives excellence in every aspect of food safety. FMEA drives excellence in every aspect of customer satisfaction. With modern software HACCP and other systems can be integrated in a FMEA implementation. A system that would allow the HACCP and FMEA to be developed in parallel would allow a food manufacturer to aim for the highest standards in food safety, and customer satisfaction. Applying FMEA analysis can make a comprehensive analysis of possible risk regimes in collagen production.

Key words: Failure Modes and Effect Analysis (FMEA), Hazard Analysis Critical Control Point (HACCP), Collagen hydrolyzate, Risk, hazard analysis, CCP (Critical Control Point).