Journal of Agricultural Production (2020) 1(1): 31-33 https://agriprojournal.com/
e-ISSN: 2757-6620 agriprojournal@gmail.com

JOURNAL OF AGRICULTURAL PRODUCTION

REVIEW ARTICLE

Application of HACCP in Aquaculture Processing

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ARTICLE INFO

Article History:
Received: 19.12.2020
Accepted: 24.12.2020
Available Online: 31.12.2020

Keywords:
Aquaculture processing
Critical control points
Food safety
HACCP

ABSTRACT

Haccp, food safety is one of the most important and critical points for human health. It can be defined as reducing the risks in biological, chemical, physical production systems that may arise in food safety and systematic preventive actions. HACCP can be shortly abbreviated as Critical Control Points Risk Analysis. Haccp is a series of food-specific standards. One of the most fundamental points in the Haccp standard is to make a hazard risk assessment and to determine critical control points and to take measures against these dangers. The Haccp standard is a set of conditions and systems for evaluating the risks that may occur during the transportation of food from the stage of production and during the use of foodstuffs. Processed seafood provides many advantages to consumers due to their long shelf life, following hygiene and sanitation rules at storage and usage conditions is crucial. Seafood processing industry is engaged in the efforts to increase the shelf life of the products, during the determination of critical control points (CCP), which is one of the important elements of the Haccp system. Correct determination of CCP will ensure that the high level quality of the product is kept for a long time. In this review, the importance and advantages of application of Haccp in aquaculture processing will be discussed.

Please cite this paper as follows:

Arslan, G. and Oğuzhan Yıldız, P. (2020). Application of HACCP in Aquaculture Processing. *Journal of Agricultural Production*, 1(1): 31-33.

Introduction

Regarding food safety, every country has a regulation on microbiological criteria in its own food production codex. Every facility that produces food within the borders of the country must comply with these criteria. However, besides these criteria, other internationally accepted food safety analysis systems are also used. One of these systems is HACCP. HACCP can be shortly abbreviated as Critical Control Points Risk Analysis. Many manufacturing businesses in the food industry around the world also use this system (Anonymous, 2020a).

HACCP is an effective quality management system in which all the steps taken from the raw material of the food product until it reaches the consumer, the whole facility and personnel, all inputs and their producers are constantly monitored and controlled, and when properly operated, it is an effective quality management system that aims to prevent all possible dangers and protect consumers from health risks (Altun, 2011).

HACCP, which is a system for ensuring food safety, does not eliminate the risk of the control in the final product, instead, it mainly determines the pathogen contamination and possible risks of the contaminants in advance, determining critical control points at certain points and preventing these risks within acceptable limits. The purpose of HACCP is to ensure the production of reliable food and trust in the product and it is still used by many countries. HACCP has taken its place in food safety as an internationally accepted system. In this respect, it should not be forgotten that HACCP is not a sufficient system alone and must be implemented together with good hygiene practices (GHP) and good manufacturing practices (GMP) in order to comply with international regulations, gain consumer confidence and increase market share in domestic and foreign markets (Mert, 2012).

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The HACCP system is designed to be used in every stage of the food industry, from growing to harvest, from processing to production, distribution, consumption. It is the most effective approach adopted in ensuring food safety today (Balta, 2005; Anonymous, 2020b)

Seafood creates a suitable medium for microorganisms, due to the high proteins it carries, thus the risk of spoilage increases, and when consumed in this way, it causes various diseases and causes significant financial losses as well as death. In the face of this situation, aquaculture importer many countries have directly implemented systems related to quality control and food safety such as HACCP, which affect the fishery trade. The most prominent application of this is that the European Union (EU) held the producers responsible for the health of the products they produced with the 85/374 / EEC directive issued in 1985, in 1991, the 91/492 / EEC and 91/493 / EEC directives In 1993, the 93/43 / EEC directive required the implementation of the HACCP system in the EU food producing companies and the food products to be imported. The USA also implemented the HACCP system in 1992, followed by countries such as Australia, New Zealand, Brazil, Thailand and Morocco, harmonizing their fisheries control systems with the HACCP system (Mert, 2012).

History of HACCP System

The HACCP system was first developed in the 1960s by a group in the Pillsbury company, which produces healthy food for the 'Apollo' space program. In this space program, the food to be produced for astronauts was asked to be 100% safe by the American National Aeronautics and Space Administration (NASA) and the HACCP concept emerged for this purpose.

This system has been used in the official inspections made by the Food and Drug Administration (FDA) in the USA since the 1970s. It started to be settled in the aquaculture industry in the early 1970s. Towards the end of the 1980s, it was fully settled in the American National Food Preservation Conference by making it mandatory with the introduction of a new, revised fisheries law based on HACCP.

In December 1995, by the decision of the European Community, all fishery producers in the community were obliged to apply HACCP. In addition, with the directive of the EU, it has been decided to import fishery products only from the facilities in the countries implementing the HACCP program. In 1996, it was made a legal obligation that the entire food industry should implement, and countries such as the Netherlands, Denmark, New Zealand and Australia published their own standards.

In Turkey, November 16, 1997 Foodstuffs also not recorded officially as HACCP Regulation, identifying critical control points, monitoring and so on. It was stated that HACCP application would be sought. The HACCP requirements are clearly stated in the food hygiene section of the Decree Law No.560 on 'Production, Consumption and Inspection of Foods' published in the Official Gazette dated June 9, 1998 and numbered 233367, and 2 from 6 years (Alpay, 2002; Anonymous, 2020c).

Application and Planning of the HACCP System

As a reliable method to ensure food safety, HACCP provides many important advantages to the business, consumer and country. These advantages can be listed as follows (Özçiçek, 2002; Ertürk, 2003; Anonymous, 2004; Altun, 2011);

a) It enables safe food production,

b) Provides training of operating personnel on hygiene and HACCP,

c) It ensures that critical tests are carried out quickly and on site,

d) It ensures that records and documentation are kept in the enterprise,

e) It reduces costs,

f) Provides widespread exchange of information,

g) Increases the marketing power of the product,

h) It also reduces the economic losses of consumers and employers against diseases caused by food,

ı) Community health and protection of the environment are provided,

i) Cases resulting in death due to food poisoning are reduced,

j) It will provide an increase in exports and income by reducing barriers in international trade and helping businesses to compete more effectively in world markets, and thus, will also contribute,

k) Facilitates the understanding and compliance of the approach to the quality management system.

Basic Principles of HACCP System

To Make Hazard Analysis

The first principle in the application of the Haccp system is to make hazard analysis. In this principle, the dangers that may arise during the production or processing of food are determined. All hazards are analyzed and risk assessment of food is made.

Determination of Critical Control Points

At this point, the HACCP team determines the control points that may create potential danger.

Determining Critical Limits

The highest and lowest values of the chemical, biological or physical results to be obtained after the measurements to be made at the control points should be determined. Measurements must be made at each checkpoint. Therefore, it is important to determine the limits.

Monitoring Critical Control Points

In this step, questions such as how to take samples from control points, which methods will be analyzed, who will be responsible for taking samples from the HACCP team and how often to take samples should be formally defined.

Determination of Corrective Actions

The steps to be followed in case of encountering a problem that would prevent the health processing of food or the implementation of the HACCP system are determined.

Verification

Here, all actions taken in accordance with HACCP are checked. These actions include the settings of the machines used. Usually, the audit team set up in the HACCP team performs this step.

Recording

In this principle, all HACCP procedures, samples, results, control points and limits are recorded. In this way, both the sustainability of the food quality is ensured and new employees are guided (Anonymous 2020a, Anonymous 2020d).

Haccp Application in Aquaculture Processing

It is because the structure of seafood is very sensitive and microorganisms start to deteriorate quickly due to the high nutritional value of the product. Accordingly, Seafood processing industry is engaged in the efforts to increase the shelf life of the products, during the determination of critical control points (CCP), which is one of the important elements of the Haccp system. Correct determination of CCP will ensure that the high level quality of the product is kept for a long time (Alpay, 2002).

The aquaculture industry is an important position in the food industry, which is of great importance in terms of sea and inland water potential of our country. It is necessary to apply the Haccp principles, which have an important place worldwide, in order to progress successfully in the field of sea and inland waters (Balta, 2005).

The developing technology has brought new requirements and obligations to the agenda in the product, processing conditions and operating controls in the aquaculture industry. Today, within the concept of quality assurance and hygiene, this system has been accepted as a compulsory application rather than an optional one. This system is a Hazard Analysis System (Haccp) at Critical Control Points. The Haccp system is designed to identify and control dangers that may occur in a food processing. Haccp provides not only microbial quality, but also increase in sensory and nutritional quality, as well as quality assurance in service / service application (Balta, 2005).

The first step in creating the Haccp plan for the processing plant is the preparation of the team, the preparation of the raw material and the final product definition. The second step is the creation of control points by working on hazard analysis studies, flow charts and basic principles. The third and final step is to write down the record keeping system, standard health work procedure, return procedure and consumer complaints in terms of creating monitoring methods (Alpay, 2002).

The Haccp system has some objectives in aquaculture processing and recycling facilities. These (Balta, 2005);

- Continuously producing safe products,
- To ensure compliance with the legislation,
- Ensuring effective use of resources,
- Ensuring that food is processed reliably after reliable production,
- To direct the business in accordance with the quality control system,
- To ensure that a versatile discipline can be employed.

References

Alpay, C. (2002). Su ürünleri işleme ve değerlendirme işletmelerinde Haccp sisteminin uygulanması ve bir fast food su ürünleri işletmesi örneği. Marmara Üniversitesi Sosyal Bilimler Enstitüsü, Yüksek Lisans Tezi, İstanbul.

Altun, İ. (2011). Süt ve Ürünlerinde HACCP Uygulaması. Iğdır Üniversitesi Fen Bilimleri Enstitüsü Dergisi, 1(2): 63-67.

Anonymous (2004). http://www.fda.gov

Anonymous (2020a). Retrieved from https://evrimagaci.org/gida-guvenliginde-haccp-sistemi-nedir-ve-nasil-uygulanir-8609. Date Accessed: 15.12.2020.

Anonymous (2020b). Retrieved from https://www.foodelphi.com/su-urunleri-muhafaza-yontemleri-doc-dr-abdullah-oksuz/. Date Accessed: 15.12.2020.

Anonymous (2020c). Retrieved from https://acikders.ankara.edu.tr/course/info.php?id=4916. Date Accessed: 15.12.2020.

Anonymous (2020d). Retrieved from https://docs.google.com/file/d/0B0jZ3Z62Gq2qenhYb0hPa1FzQnc/view. Date Accessed: 15.12.2020.

Balta, Ö. (2005). Su ürünleri işletmelerinde Haccp sisteminin uygulanması ve deniz salyangozu işleyen bir firma örneği. Marmara Üniversitesi Sosyal Bilimler Enstitüsü, Yüksek Lisans Tezi, İstanbul.

Ertürk, Y. E. (2003). Dünya'da ve Türkiye'de kritik noktalarda tehlike kontrolü (HACCP) uygulaması. Ankara Üniversitesi Fen Bilimleri Enstitüsü Tarım Ekonomisi Anabilim Dalı, Doktora Semineri, Ankara.

Mert, İ. (2002). Küreselleşme ve Su Ürünlerinde Kalite Kontrol. SÜMAE YUNUS Araştırma Bülteni, 2:1, Mart 2002.

Özçiçek, C. (2002). Tüketicilerin işlenmiş gıda ürünlerinde kalite tercihleri, sağlık riskine karşı tutumları ve besin bileşimi konusunda bilgi düzeyleri (Adana örneği), Çukurova Üniversitesi. Fen Bilimleri Enstitüsü Tarım Ekonomisi Anabilim Dalı, Doktora Tezi, Adana.