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## **FORMING COMPETITIVE ADVANTAGE IN FOOD AND AGRICULTURAL INDUSTRY BY IMPLEMENTING SAFETY AND QUALITY MANAGEMENT SYSTEMS**

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**Abstract.** The article considers and examines basic quality and safety management systems approved by the Global Food Safety Initiative. Fresh mushroom market of Western Europe and Ukraine are analyzed. Ukrainian mushroom industry was taken as an example to illustrate how European integration process effects on quality and safety management systems implementation in food industry. Suggestions of increasing competitive positions of domestic food products were given.

**Keywords:** competitiveness; quality management system; product safety; hazard analysis; subsidies.

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## **ФОРМУВАННЯ КОНКУРЕНТНИХ ПЕРЕВАГ В ХАРЧОВІЙ ТА СІЛЬСЬКОГОСПОДАРСЬКІЙ ПРОМИСЛОВОСТІ ШЛЯХОМ ВПРОВАДЖЕННЯ СИСТЕМ УПРАВЛІННЯ БЕЗПЕКОЮ І ЯКІСТЮ**

*Александрова, К. І. Формування конкурентних переваг в харчовій та сільськогосподарській промисловості шляхом впровадження систем управління безпекою і якістю // Вісник соціально-економічних досліджень: зб. наук. праць; за ред. М. І. Зверякова (голов. ред.) та ін. (ISSN 2313-4569). – Одеса: Одеський національний економічний університет. – 2017. – № 1 (62). – С. 58–63.*

**Анотація.** У статті розглянуто та досліджено основні системи управління якістю і безпекою продукції, схвалені Глобальною ініціативою з безпеки харчових продуктів. Проаналізовано ринок свіжих грибів країн Західної Європи і України. На прикладі української грибної галузі проілюстровано вплив процесу європейської інтеграції на впровадження систем управління якістю та безпекою в харчовій промисловості. Надано пропозиції щодо підвищення конкурентоспроможності продуктів харчування вітчизняних підприємств.

**Ключові слова:** конкурентоспроможність; система управління якістю; безпека продукції; аналіз небезпечних чинників; дотації.

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## **ФОРМИРОВАНИЕ КОНКУРЕНТНЫХ ПРЕИМУЩЕСТВ В ПИЩЕВОЙ И СЕЛЬСКОХОЗЯЙСТВЕННОЙ ПРОМЫШЛЕННОСТИ ПУТЕМ ВНЕДРЕНИЯ СИСТЕМ УПРАВЛЕНИЯ БЕЗОПАСНОСТЬЮ И КАЧЕСТВОМ**

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*Аннотация.* В статье рассмотрены и исследованы основные системы управления качеством и безопасностью продукции, одобренные Глобальной инициативой по безопасности пищевых продуктов. Проанализирован рынок свежих грибов стран Западной Европы и Украины. На примере украинской грибной отрасли проиллюстрировано влияние процесса европейской интеграции на внедрение систем управления качеством и безопасностью в пищевой промышленности. Даны предложения по повышению конкурентоспособности продуктов питания отечественных предприятий.

**Ключевые слова:** конкурентоспособность; система управления качеством; безопасность; анализ опасных факторов; дотации.

**JEL classification:** Q100

## 1. Introduction

Nowadays, worldwide trends on food safety and quality are well distinguished from the side of government, manufacturers, food vendors and consumers. Meanwhile, customers pay more attention to product's quality and safety characteristics while making choice of consumption. Year-in, year-out an increasing number of large companies gives preference to organizations that implemented quality and safety management system. Consequently, METRO Cash & Carry Ukraine is only Ukrainian trading company which is certified according to international food safety standards. The company has set a goal to work only with suppliers who are certified due to one of the standards approved by the Global Food Safety Initiative [1].

## 2. The main material research

Quality and safety parameters of a food product are highly observed by local government agencies and international organizations. Their purpose is to assure consumer's confidence in safety and quality of food products. One of the most distinguished organizations is the Food and Agriculture Organization of the United Nations or the FAO. The main objectives of the organizations are:

- strengthening of the national legal framework in order to control of food quality and safety issues and expanding the membership of countries-participants in the Code;
- providing independent scientific advices through JECFA expert bodies to support JEMRA and standard settings of the Code;
- strengthening of food safety to prevent food chain contamination;
- development of an online platform for global networks and databases to share information for food safety management.

Another worldwide spread program is Global Food Safety Initiative. GFSI was found in 2000 as a non-profit international organization to develop common requirements of quality and food safety [2]. GFSI is the result of cooperation between the leading world experts in the field of food safety in order to provide continuous improvement in food safety management systems to ensure confidence in the matter of delivery of safe food to consumers worldwide. GFSI is not a standard, but only establishes the requirements for food safety standards.

Certification to a GFSI recognised scheme is achieved through a successful third party audit against any of the schemes listed as being recognised by GFSI.

The basic idea of GFSI means “Certified once – recognized everywhere”. For this reason, certification by one of the standards recognized by the GFSI allows a company not to be certified by other equivalent standards.

Thereby the author selected four most popular and commonly used standards to be examined – FSSC 22000, BRC, IFS and SQF.

Scheme FSSC 22000 (Food Safety System Certification) is a safety management system that provides a framework for the effective food safety management and is applicable to all operators of the food chain (the operators of the food chain are all subjects of market who's actions may influence safety and quality of food products. Among them are production, packaging, storage, and

distribution to the final user). The scheme is managed by an independent FSSC 22000 fund. The fourth variant of the scheme will be published in 2016 [3]. The scheme is based on independent international standards specifications and demands which altogether form FSSC 22000 scheme. They are ISO 22000, ISO/TS 22003, ISO 19011, and additional demands (annex 1A: FSSC 22000).

The basis of FSSC 22000 scheme is ISO 22000:2005 “Food safety management system”, “Requirements for any organization in food chain”. ISO 22000 standard has been specifically designed for easy integration with ISO 9001 “Quality management systems”, duplicating its management system with some modifications on the safety of products especially for the development and implementation of risk management system based on HACCP principles, which will be examined later. The ISO 22000 is broadly used among Ukrainian companies-participants of the food chain. It is worthy to note, that ISO 22000 itself is not recognized recognizable by the GFSI standard because it does not cover all the requirements for the production, control, and implementation of safe food production, but it satisfies Ukrainian legislation requirements in concern of safe product production.

ISO/TS 22002-1:2009 “Prerequisite programmes on food safety – Part 1: Food manufacturing” depicts requirements for establishing, implementing and enforcing obligatory programs to be performed by a company to control release of safe products.

ISO 19011:2011 “Guidelines for auditing management systems” provides basic requirements for performing internal audits and managing audit teams.

Five additional requirements (Annex 1A: FSSC 22000 from 04.10.2013) include requirements for technical specifications, supervision of staff, the specific regulatory requirements, which are declared by non-routine inspections of certified companies (if an incident on the food safety takes part) and managing the input information.

Let us concentrate on product safety confirmation. Sometimes an auditor will not regard provided information that confirms safety of a finished commodity for several reasons. During the production activity food companies examine quality and safety characteristics of a product by verifying temperature, water analysis, analysis for pesticides, etc. The most important is the right choice of a laboratory. The standard regards analysis from the laboratories that satisfy demands of ISO 17025 “General requirements for the competence of testing and calibration laboratories”. By way of example, Odessa Sanitary-epidemiological station laboratory is accredited by local GOSTs, but not accredited to ISO 17025. In this case, Odessa SES water analysis cannot be taken into account in the quality and safety system audit.

Furthermore let us describe a standard which is prevalent in such countries of Western Europe as the UK, France, Portugal and Spain.

BRC Global Standards (British Retail Consortium) presents series of international standards for the food industry, manufacturers of packaging, and consumers. BRC is based on the requirements of the quality management system and GMP (Good Manufacturing Practice and Good Manufacturing Practice) principles application. Likewise FSSC 22000, BRC is based on the application of risk management based on risk analysis according to HACCP principles. In order to ensure compliance with the standard you need to do next:

- develop and implement risk management (based on HACCP principles);
- have a documented and implemented quality management system;
- manage processing of production, correct functioning of environment and staff.

More than 18000 suppliers in more than 100 countries are certified by BRC [3].

Next coming standard is widely used in Germany and Austria. IFS (International Food Standard) is used by companies producing and processing products and producing the original packaging as well. The standard was developed by German and French federations of traders. Implementation of

the standard is particularly important for those manufacturers who are focused on cooperation with brand product vendors. Requirements of the standard are built on the principles of HACCP, GMP (Good Manufacturing Practice), GLP (Good Laboratory Practice) and GHP (Good Hygiene Practice) [4].

The last observed standard is SQF management system. It was developed in the United States and was spread out there. The system comprises the principles of vendors' network management while manufacturing raw materials and production with distribution of food merchandise. The system focuses on the systematic application of HACCP in order to control food quality safety hazard. Implementation of the system is important for businesses supplying local and global food markets [5]. Three levels of SQF certification can be distinguished. Among them:

- Basics of Food Safety.
- Certification of food safety products based on HACCP.
- Integrated quality management system and food safety.

All the above mentioned standards and schemes include the HACCP system, which is the basis for production and management of product safety.

HACCP (Hazard analysis and critical control points) is the concept of systematic identification, assessment and management of hazards that affect safety of products. HACCP was developed in the United States in the year 1960 in secrecy by Pillsbury, who worked on for NASA. The goal of the system was to ensure food security for American astronauts. HACCP Guidance document was adopted by the Commission in the year 1993 "Codex Alimentarius" [6]. Codex Alimentarius is a set of international food standards accepted by the International Commission of FAO/WHO. FAO (Food and Agriculture Organization) is an International food and agriculture organization of the United Nations under the auspices of WHO (World Health Organization) – the UN special institution for implementation of Codex Alimentarius standards and regulations regarding food products.

The methodology of the system is based on examining each stage in food production, identifying, and assessing specific risks that affect safety of products. Also, it is based on implementing effective control and monitoring of measures to control the identified risks till they abolish or reduce to an acceptable level.

HACCP is not a system of any risks. It is a preventive system to maintain food products' safety. Implementation of HACCP system is important for protection of production processes from biological, chemical, and physical hazards of pollution. This increases safety of a product and protects a brand itself by reducing complaints and claims on the market. The HACCP system is applicable for food manufacturers and companies, whose operating results influence food industry and impact safety and quality of a product.

Functioning of the HACCP system simplifies implementation of recognized GFSI standards and schemes for an enterprise because quality and safety management systems are based on HACCP elements.

Considering Ukraine, the law ensures implementation of HACCP elements at food producing enterprises. The law "On safety and quality of food" says "Market operators develop, implement and use procedures based on the principles of a system of hazard analysis and critical control points ..." [7]. However, Ukrainian enterprises implement safety management systems in practice slowly. The reason is high costs which are required to set infrastructure of the enterprise according to international standards and high costs for the creation and implementation of the system itself.

In general, the main aspects on food safety and quality are depicted in the following three sources:

- "On the basic principles and requirements for food safety and quality": Law of Ukraine, No. 771/97-VR, 23.12.1997;

- “On amendments to certain legislative acts of Ukraine regarding food”: Law of Ukraine, No. 1602-VII, 22.07.2014;
- “On approval of microbiological criteria for food safety indicators”: Order, No. 548, 19.07.2012.

Implementation of quality and safety management systems provides access to new markets for domestic producers. Therefore, the producer should choose a system regarding its popularity in countries of potential markets.

Analyzing the perspectives of food and agricultural development in Ukraine let us observe fresh mushrooms European market as an example.

Furthermore let us consider the experience of fresh mushroom market development in the period of Poland’s accession to the EU. This period begins with support of the Polish agricultural sector from the side of EU. For the mushroom sector such an example is the subsidy mechanism [8].

A subsidy mechanism is clearly represented in the project “Piecarka-Centrum” (“Mushroom Center”) – an association of eight major mushroom growing manufacturers.

In 2009 the company «Piecarka-Centrum» obtained EU subsidies on development of infrastructure, modernization of material, and technical basis of the factories.

The project reimbursed 75% of costs carried out by EU subsidies to be paid by the end of construction works. Total amount of the investment project was 20 million Polish Zloty or EUR 4.6 million. For comparison, all subsidies of Romania mushroom sector accounted for EUR 4 million a year at the same period [9]. EU subsidies were addressed on construction of warehouses, packaging and sorting facilities, as well as on the purchase of new equipment, machinery, tools and harvesting equipment.

Completion of the project in 2012 resulted in creating a modern and well equipped mushroom growing center with production capacity up to 28 thousand square meters with the possibility of a systematic increase of production capacity. As a result the productivity rose three times from 2 to 7 thousand tons by the 2014.

This policy of subsidizing the agricultural sector resulted in a significant increase of mushroom cultivation industry. Poland has become a leader in production of mushrooms in Europe, shifting the Netherlands, which used to be the most advanced country in the field of agriculture which held the leading position in the mushroom market for over 30 years.

Nowadays, Polish market comprises over 25 different kinds of fresh and preserved mushrooms exported to most countries in Europe. Production is sold in the domestic market mainly through supermarkets and is exported to many countries including France, Germany, Great Britain, Sweden, Greece, Norway, and Russia until the year 2014 [10]. Russia produces mushrooms around 8 tons and covers the local market demand only at 10% [11]. The remaining 90% of the fresh mushroom market in Russia was mainly presented by Polish import (about 70 tons). After Russia banned European Union merchandise import a significant surplus of Polish mushrooms was formed on the European market. It was distributed to the markets of Bulgaria, France, Belgium, and so on. The excess supply led to a decrease in sales price of mushrooms by 20% (from EUR 1.20 for 1 kg to EUR 1.00 for 1 kg) [12].

Trade with the European Union will open the access for Polish mushrooms on the Ukrainian market. Products of local manufacturers are slightly inferior to the Polish mushrooms for both technological and financial reasons. The first reason lies in use of local raw material, which is the second phase compost by Ukrainian enterprises. In Poland, the cultivation is performed by using the third phase of compost that improves the quality parameters of a product and reduces the period of growing for 25% or for 2 weeks. This factor ultimately increases turnover of current assets. The second reason is the lack of industry subsidies in Ukraine and the subsidizing of the industry in Poland in the mid-2000s, which made it possible to reduce the cost of Polish mushrooms’

production significantly. As a result, despite the high labor costs and energy resources, the cost of Polish mushrooms is lower compared to the cost of Ukrainian mushroom.

As a result of this process, Ukrainian mushroom producers face the challenge of increased competition in the local market. In this situation, the most important factor of strengthening the competitive position is to develop the resource base and to expand markets. Further to abovementioned launch of the third phase compost in Ukraine was planned for summer 2014. However, due to the deteriorating economic and political situation in the country it was moved to the end of the year 2016. While the first problem is improving significantly entering new markets still demands certification of a product according to international standards.

### 3. Conclusions

European integration contributes to the implementation of quality and safety management systems immensely through export facilitation. In the context of a prolonged economic and political crisis in the country progressive inflation drastically reduced the attractiveness of local markets. At the same time, the export of products becomes increasingly attractive. In order to satisfy the European market requirements the suppliers must provide with high-quality product which is supported documentary by international certification systems. In consequence it opens the possibility of entering new markets and strengthens brand credibility of local consumers by increasing competitive positions of a product.

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