

*Review*

# An analysis of the HACCP system implementation- The factor of improving competitiveness in Serbian companies

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Accepted 08 November, 2018

The implementation of international standards on the market represents a necessary element in the process of improving a company's competitiveness. Customer care, healthy and safe food, ecological standards represent only some of the conditions that modern business requires from producers of food products. The implementation of the HACCP (hazard analysis and critical control point) system, that is standard ISO 22000:2005– Food safety management systems– Requirements for any organization in the food chain, represents one of many requirements directed towards companies in the function of customer health care. Its implementation is becoming compulsory for all companies whose aim is exporting products to European Union countries (EU) and the World Trade Organization (WTO). This paper is a critical analysis and evaluation of the policies and implementation of standards and systems which relate, above all, to quality, environmental and food safety management in Serbian companies. In addition, it offers specific recommendations for improving the competitiveness of Serbian companies within regional and global frames.

**Key words:** Quality, competitiveness, standardization, QMS, HACCP.

## INTRODUCTION

The basic aim of modern business is achieving business excellence and world class products and services. Those companies which actively and permanently apply modern management methods and techniques have much better chances of strengthening their competitive abilities on the global market and also taking a stable market position with good perspectives for further growth. Global competitiveness is becoming more intensive and noticeable. Taking into account the intensity and complex nature of competitive relations in the global economy at the beginning of the 21st century it is much more difficult to achieve market success. The reasons can be found in

the following facts: the power has been transferred from producers to distributors; multinational companies are becoming more powerful; new products have a shorter "life span"; consumer goods have a shorter "life span" than before; digital technology has caused the development of a wide range of new products; the number of registered trade marks and patents has increased; the number of available products is constantly increasing; markets are hyper -fragmented; advertising space is becoming crowded and customers are becoming choosy (Kotler and de Bes, 2005).

Global competitiveness is moving from the level of prices and technical innovations towards knowledge management and innovations in the field of management and marketing (Djordjevic et al., 2009). In modern business the focus is on the macro-background instead

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of a particular market. This means that customers are not the only ones who are in the focus, but the society as a whole. New business conditions require the adaptation of business actors and the building of organizational structures based on new postulates. This is especially important for countries in transition– the final aim of building a new organization is that it becomes extremely flexible and innovative in order to satisfy the growing customer requirements in a shorter time and to achieve a competitive advantage. The implementation of integrated management systems (IMS) facilitates the establishment of the aims of quality in a much shorter time period, which in turn serves to establish the necessary conditions for business organizations from less developed countries– this is especially important for transitional countries– to build such business systems and management, by respecting the requirements of international standards, which will enable them to create competitive products and to realize the aims of business excellence. Thanks to the standardization process of partial management systems, customers feel safe while buying products and services.

One of the most important sectors, from the angle of participation in contributing to the gross national product (GNP) in the Republic of Serbia, in the manufacturing industry and within it is the production of food, drinks and tobacco have the greatest influence on creating the country's GNP. The National Strategy for Economic Development in the Republic of Serbia, published by the Serbian Government (SG, 2005a), highlights the implementation of the standard concerning food safety as one of the most important measures for improving branch competitiveness in the food industry. This standard should secure full health and safety of food products in all segments of production and processing.

### **THE ROLE OF IMPLEMENTING HACCP IN THE PROCESS OF IMPROVING A COMPANY'S COMPETITIVENESS**

Standardization means issuing conditions that a certain process, product, service, material or raw material must satisfy. Standardization also assumes defining and issuing continuous requirements that a product, service, process or management system must fulfil within a certain period of time. Integrated management systems (IMS) represent the current developmental stage of the management quality concept which is based on the integrated implementation of numerous international standards from the field of organizational management. The implementation of Integrated management systems assumes the integration of international standards for quality management systems (QMS), environmental management systems (EMS), the management of employees' safety (OHSAS– occupational health and safety assesment series), etc. whose base consists of

implementing the requirements set out in the aforementioned standards. QMS is, in fact, the base for superstructuring other standards for managing business segments and its final aim is achieving business excellence. One of the standards representing the part of integrated management systems is the ISO 22000:2005 standard– Food safety management systems– Requirements for any organization in the food chain, which deals with issues of safety in the production of food and food products, that is HACCP (the Hazard Analysis and Critical Control Point) system.

Developed countries currently pay more attention to the production of safe and high quality food which is sold to their final customers. For this reason, import companies from developed countries demand safe food, from primary production to the processing industry, including packaging according to strict hygienic rules. Nowadays, companies from the EU working in the food industry have become much more demanding concerning the safety of food products from non-EU countries. In other words, those companies which want to do business on the EU market must include all food safety procedures and the implementation of the HACCP system in their processes.

The HACCP system consists of seven principles that efficiently provide full food product safety in all segments of production and processing. The system enables the determination and estimation of the critical point for product contamination in all spheres of production, as well as creating control instruments. In relation to the control of final products at the end of the production process HACCP represents a preventive system that provides food safety in every segment of the production process. By implementing HACCP standards, food producers benefit considerably especially with regard to customer protection– the standard provides for the production and sale of safe food. The implementation of HACCP is widely used in the developed world, while in EU countries it is regulated by law (Council Directive 93/43/EEC). The primary aim of every HACCP system is preventing problems that may arise during the production process.

From January 1st 2006, the HACCP concept became a compulsory requirement in the food industry on the markets of the EU and WTO. This was accompanied by the implementation of a new quality standard, EuroGAP (European Good Agricultural Practices), which is even more demanding than HACCP. In addition to HACCP criteria, the EuroGAP certificate also assumes standards for the ecology of parcels. There are three market trends which initiated the adoption of this standard: the increasing complexity of the supply chain with regard to big retail chains, the increased impact of business background and the general increase in complexity of market requirements, namely customer requirements.

The main focus of the European Committee in the field of HACCP is on the management of small food producers and the system of traceability. Great care is necessary

because new European legislation is constantly adding new directives and rules in the field of food production which require technical specifications. Hence, the implementation of HACCP is one of the critical points for developing the competitive abilities of small and medium-sized companies in the food industry.

## **AN ANALYSIS OF THE BUSINESS DOMAIN IN THE REPUBLIC OF SERBIA'S FOOD INDUSTRY**

One of the most important sectors in creating the GNP in the Republic of Serbia is the processing industry. The production of food products, drinks and tobacco has the most important and the greatest influence on forming the GNP in the processing industry with a share of 31.4%, (SG, 2005a). In 2009, Serbia exported products and services to the value of USD 8 billion (Table 1). On the ranking list of successfulness according to export value, Serbia is in 86th place out of 223 analyzed countries. The Republic of Serbia's main export markets are Bosnia and Herzegovina (12% participation in total exports), Germany, Italy and Montenegro (with 10% participation in the total exports) and Romania (6% participation in the total exports). All other markets participate in Serbian exports with 52%. Agriculture participated in the GNP with 12.6%, while the processing industry contributed 18.7%. According to the Serbian Chamber of Commerce (SCC, 2010), in 2009, agriculture absorbed 24% of the total labour force in the Republic of Serbia, while 19.9% of the total labour force was employed in the processing industry. Serbia has a surplus of production capacities in the majority of its sectors. The slaughterhouse sector works with 40% capacity and there is a capacity surplus in the production of flour and milk (SG, 2005b). The greatest part of unused processing capacities was inherited from the socialist sector and it can no longer be used because of out of date technology. Low productivity is also a chronic "disease". The best producers do not use 100% of their capacities. The implementation of EU standards in production processes will increase the problems with low productivity and the competitiveness of domestic food products.

The problem of productivity is not new to the transitional period but was also present in the previous period. The domestic economy has had these problems for some considerable time as a result of inappropriate working methods which were not based on market principles. The consequences were unrealistically high prices for some products which were not competitive on the world market. For all these reasons domestic companies reduced export prices in order to be competitive on foreign markets and the difference in low productivity had to be paid by domestic customers through the purchase of more expensive products. Old and out of date technology, poor quality, unattractive packaging and high prices are among the main reasons

why Serbian products cannot be competitive on the international market. The analyses carried out by The Centre for Research in the Economy (SCC, 2010) show that productivity in the Republic of Serbia is only 42% of the European average. Poor organization of work, old technology and insufficient knowledge represent the reasons for such a low percentage and the consequences are a lack of competitiveness, a reduction in consumption and unemployment. Technological equipment also represents an important element of productivity growth. The average age of equipment in Serbia is 30 years. In comparison to the situation in the region it represents a delay of 12 years. According to the data compiled by the Serbian chamber of commerce, from January to May 2010, 396.7 million EUR was realized from direct foreign investments (Table 2). The main obstacles which prevent a higher level of direct foreign investments are: poor infrastructure, expensive business performance, administrative obstacles, expensive credits and bad legislative function.

## **THE IMPLEMENTATION OF THE HACCP SYSTEM IN THE REPUBLIC OF SERBIA, A PRE-CONDITION FOR IMPROVING THE COMPETITIVENESS OF THE FOOD INDUSTRY**

As one of its priorities in developing agriculture, the Serbian Government has defined the improvement of quality standards and product safety according to EU requirements, as well as increasing the general level of competitiveness of domestic agricultural producers (SG, 2005b). The competitiveness of the Republic of Serbia is not satisfactory. According to the global index of competitiveness of the World Economic Forum (WEF, 2010), in 2009, Serbia was in 93rd place out of 133 countries. In only a year Serbia fell eight places. Slovenia, Montenegro, Croatia, Macedonia, Hungary, Romania, Bulgaria and even Panama and Kazakhstan are in front of Serbia. In our region, only Bosnia and Herzegovina is behind Serbia— in 109th place (Table 3). The least competitive is the processing industry, metal manufacturing and electronics where there has been no technological renewal for years. Businessmen consider customs and tax relaxations to be necessary, as well as a reduction in administrative charges and prices for gas, fuel and electrical power in order to increase competitiveness. It is also necessary to increase the level of technological equipment.

The research results, dealing with the analysis of young people's attitudes to their inclusion in entrepreneurship processes as well as their opinions about socially responsible practice (Djordjevic et al., 2010), represent the opinions of future experts and senior managers. The research was carried out at the end of 2009, on the territory of the Republic of Serbia. It included 520 students oriented towards management. Those

**Table 1.** The most important products in the Republic of Serbia's exports according to the Statistical Office of The Republic of Serbia (SORS, 2010)

Number	Product	Value (in millions of dollars)
1.	Warmly rolled products	42
2.	Electrical energy	17
3.	Raspberries	17
4.	Corn	16
5.	Automobile tyres	14
6.	Copper plates and sheets	12
7.	Tights	11
8.	Aluminium sheets	10
9.	Tinned products	8

interviewed stated the following as the necessary elements for the development of the competitive abilities of domestic companies: the permanent training of employees and management (25.49%), significant investment in marketing (22.13%), the standardization of business quality (12.89%), the development of relationship marketing (10%) and the implementation of modern management techniques and methods (8.7%).

Taking into account that the economy of the Republic of Serbia has significant potentials for the production and export of safe and quality food, the implementation of the HACCP system (standard ISO 22000:2005) in the food industry represents the main priority. The examples of those companies which have already implemented this concept have shown that it can be implemented in two ways: as an integrated system with QMS (ISO 9000 series) or independently, by implementing HACCP as an efficient system for providing the safety of food products. In order to encourage the implementation of international standards in domestic companies the Serbian Government has passed a decree on using incentives for the implementation and certification of the food safety system in domestic companies. The first decree was passed in 2005 and 2006 it was renewed with increased funds for co-financing companies. Companies and entrepreneurs which deal with the production and distribution of agricultural and food products, animal food, collecting, processing and destroying animal waste have the right to take advantage of these incentives. Since 2006 the Serbian Investment and Export Promotion Agency has also provided financial aid to domestic companies for introducing HACCP standards.

The received funds may be used for the following purposes: the implementation and certification of the HACCP program integrated with QMS-ISO 9001, or the HACCP program integrated with QMS-ISO 9001 and the management system for environmental protection- ISO 14001.

The amounts are determined on the basis of the estimated project value for:

1. The implementation and certification of the HACCP program.
2. The implementation and certification of the HACCP program integrated with QMS-ISO 9001.
3. The implementation and certification of the HACCP program integrated with QMS- ISO 9001 and the management system for environmental protection - ISO 14001.

During 2006, 343 companies signed the contract for using funds for the implementation and certification of the food safety system (and were thus obliged to implement and certify the integrated HACCP/ISO 9001 system), while the number of companies was 242 in 2005.

This information shows the increased number of requirements for food safety standards. However, the needs are much greater especially because of the strict food safety standards of EU markets. Our slaughterhouses, for example, have lost the opportunity to export meat because of their failure to respect the strict regulations set out by the standard. Domestic wholesalers required written confirmation from their suppliers concerning quality and food safety issued by accredited organizations registered in the Republic of Serbia even before legal term and in harmony with their business policy. Through an analysis of the structure of those companies that used subventions, it was concluded that food safety standards represented an imperative for all companies dealing with food products: the production of drinks 18%, cold storage plants 16%, the mill- bakery industry 15%, confectionary 15%, dairy plants 15%, meat production 10%, the production of ketchup, mayonnaise and mustard, powder, animal food and health food 10%.

Table 4 presents data pertaining to the position of Serbia in comparison with other countries of the Western Balkans according to the number of certified companies and on the grounds of the ISO report for 2008. Considering the ISO 9001 certificate, Serbia is in second place after Croatia. Considering the implementation of ISO 14001, the first two places are held by Slovenia and

**Table 2.** Direct foreign investments in Serbia –according to branches (January-May, 2010)  
www.pks.rs.

Number	Country	In EUR millions
1.	Financial business	149.3
2.	Processing industry	114.7
3.	Real-estate	32.8
4.	Traffic	28.1
5.	Wholesale and retail trade	26.3
6.	Civil engineering	3.5
7.	Agriculture	2.2
8.	Production of electrical power and gas	2

**Table 3.** Ranking the countries of the Western Balkans according to competitiveness in 2009 (WEF, 2010).

Country	Place
Slovenia	37
Montenegro	62
Croatia	72
Macedonia	84
Serbia	93
B &H	109

**Table 4.** Number of certified firms in the countries of the Western Balkans for 2008, (ISO, 2009).

Country	ISO 9001:2000	ISO 14001:2004	ISO 22000:2005
Albania	43	0	4
Bosnia and Herzegovina	811	60	3
Croatia	2.302	343	88
Montenegro	160	17	9
Serbia	2.091	176	17
Slovenia	1.945	672	12
Macedonia	271	26	19

Croatia, while Serbia is in third place with 176 certified companies. In terms of the HACCP system in the region, Croatia has the majority of certified companies followed by Macedonia and Serbia. This data shows the fields of export orientation of the companies from the mentioned countries in which agricultural products play a significant role.

A significant number of companies from the food industry belong to the group of small and medium sized (SMEs) companies. In the Republic of Serbia, small and medium-sized companies participate in the total number of companies with 99.8%; 65.5% in employment, 67.6% in turnover and about 36% of the GNP. In the total exports, the SMEs sector participates with 50.2%, in imports with 64% and with 51.2% in investments in the

non-financial sector. Micro companies are dominant in the SMEs sector with 95.6% participation in the total number, and they employ almost 50% of all employed people, according to the Official Gazette (2008). In the EU, the group of SMEs is highly engaged in the implementation of food safety standards, which is regulated by law in order to protect customer rights. EU countries pay a great deal of attention to quality and safe food. Therefore, those companies which want to do business on EU markets have to fulfil food safety standards.

The economic progress and development of the Republic of Serbia demands the need for the development of a competitive economy based on knowledge, new technologies and innovations. In order to

achieve this aim entrepreneurship is expected to make an important contribution to economic and social development. Hence, the readiness of the SMEs sector to rapidly take over the EU market, the adoption of required standards and the reduction of differences in the level of development are of significant importance. The main pillars of the SME development are: the stimulation of founding new companies, the improvement of employees' and management skills, improvements in the spheres of financing and taxation, the promotion of exports and innovations and the development of legislation and the business environment. The implementation of the HACCP system, as the procedure for the improvement of companies management methods and techniques, establishes the preconditions for improving the competitiveness of small and medium-sized companies in the field of food processing.

On the other hand, the standardization of business quality and the implementation of international quality and food safety standards are directly connected to cluster development. Clusters offer the following advantages to SMEs companies: better access to new skills and knowledge, common services, partnership support, product branding, the development of marketing strategies, joint work on innovations, more efficient implementation of QMS and the co-financing of private and socially owned companies.

## CONCLUSION

Quality represents the competitive ability factor in modern organizations. The majority of business organizations from transitional countries have problems achieving and maintaining competitive ability on international markets. According to Masaaki Imai (2008), although delays in the implementation of new technologies are very expensive, delays in applying new management techniques are no less so. Domestic companies have to create clear development strategies in accordance with European and global integration trends and the implementation of modern management methods and techniques, such as integrated management systems, represent the basic precondition for successful market development. The implementation of IMS is of great importance for companies from transitional countries because these companies should improve their competitive abilities on the global market in a short time and the implementation of IMS represents the only means of achieving this aim.

According to analysis carried out by the Economics Institute in Belgrade (EIB, 2010), the post-crisis model of economic growth and development of the Republic of Serbia until 2020 assumes the following directions:

Increase of exports, the finalization of the economy's restructuring and the encouragement of agriculture and the processing industry. One of the measures which was emphasised in the aforementioned study, and which refers to the development of the agricultural industry, is the implementation of the following standards: HACCP, ISO 22000 and ISO 14000, GLOBALGAP (an internationally used management system for Good Agricultural Practice), GOST (or GOST R - Russian national standards) as well as the certification of products pursuant to religious standards in food production.

The implementation of the HACCP system and obtaining certificates for food safety represent the basic conditions for improving the competitive ability of those companies belonging to the food processing field, especially for those which can grow and develop by doing business on EU markets.

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