INTERNATIONAL FOOD STANDARD AND FOOD SAFETY SUPPLY CHAIN OF CROATIAN CHOCOLATE PRODUCER – IMPLICATION FOR THE FINAL PRODUCTS TRANSPORTATION

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Abstract

Today's world is demanding food safety for the final consumers. Consumers are looking more carefully for the information about the food they are buying and consuming. Besides final consumers, supermarket chains are also trying to have excellent food quality in their supply chain. Therefore there are many different food standards that are companies using in order to bring food safely to final consumers in all parts of supply chain. One of those standard is International Food Standard which is looking all parts of supply chain network from arrival of the raw materials, production until delivery to the supermarket chains.

Paper will present different food standards that are currently being used in world and will look more carefully on the International Food Standard which is needed for companies that would like to produce private labels for supermarket chains.

Since not many Croatian companies have been certified for this standard it is necessary to introduce its demands and its benefits for the companies. Therefore paper will evaluate influence of the International Food Standard on the food safety supply chain and business procedure of one Croatian company in area of chocolate products transportation. This paper will be a starting point for further research about relation and influence of food safety standards on supply chain networks.

Key words: food safety, international food standard, logistics, food safety supply chain

1. INTRODUCTION

Food safety today is one of the most important things for food producer and for the final consumers on the market. Consumer concern about treats associated with food is growing and the food quality and food safety has become major issue in media and in the public in the recent years. Production and sale of food with suitable quality is fundamental element of gaining confidence of consumers on every market.

Companies which offer and sell their products on the market are changing their behavior regarding food safety and trying to implement every standard market is

introducing in order to satisfy their buyers (i.e. wholesalers, supermarket chains, etc.) and in the end final consumers. Additionally threat for food safety is coming from the fact that international trade in food products is increasing since technical and trade barriers are reduced or completely gone in some countries so this is representing a new source of potential risks in food supply chain networks.

The main goal of this paper is to introduce different food standards companies can apply for and be certified and how this standards influence their supply chain network – what companies have to do, how to apply, what investments have to be done and what are the benefits, etc. Paper is divided in several parts. In the first part different food standards are presented and especially International Food Standard. In the second part we will talk about benefits of the standard for the company, for its food safety supply chain and for the buyers. In the last part we will present why and how Croatian chocolate producer apply for this certificate and what had to be done in company in order to be certified according to this standard and how this has improved safety of the food supply chain network toward buyers and final consumers.

2. FOOD SAFETY STANDARDS

Why do companies need food safety standards among other available quality standards is the question everyone could and probably should ask? Besides obvious answers – potential risks for health of the final consumers there are also complex challenges in today's food supply chain and that is the reason why many of the world's food retailers are asking and demanding certification of their suppliers according to Global Food Safety Initiative (GFSI) schemes. The Global Food Safety Initiative (GFSI) is an industry-driven initiative which provides guidance on food safety management systems necessary for safety along the supply chain (GFSI, 2015). GFSI work is being done through collaboration between the world's leading food safety experts from retail, manufacturing and food service companies, as well as international organizations, governments, academia and service providers to the global food industry.

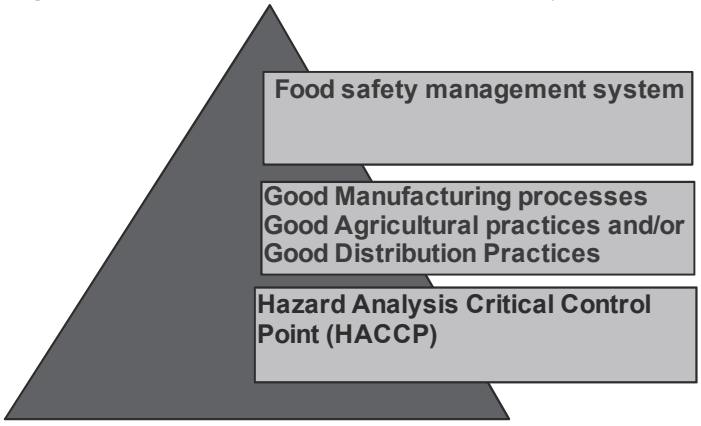
The main reason for establishing GFSI was to ensure confidence in safe food deliveries while continuing to improve food safety along the supply chain network. The GFSI standard scheme include Safety Quality Food (SQF), British Retail Consortium (BRC), International Food Standard (IFS), Food Safety system Certification (FSSC), GLOBAL G.A.P. and Best Aquaculture Practices (BAP) and CanadaGAP (NSF, 2015) and they include all parts of the supply chain network from food itself, packaging process, packaging materials, storage and distribution for primary producers, manufacturers and distributors. Standards are being verified through third-party certification and they are growing trend in the food industry. In order to remain competitive on today's more and more global market companies are increasingly adopting food standards and are subjected to food safety audits on a regular basis to maintain this certification.

Companies approach certification *at the level of the individual company, the level of individual (closed) chains of cooperating companies and the level of open networks of connected supply chains* (Beulens et. al., 2005: 482).

2.1. World food supply chain safety standards

Verification and certification to different food standards has become a growing trend in food industry worldwide. The main reason why companies are deciding to go through certification process is to become competitive. In order to maintain their certificates they are subjected to food safety audits on a regular basis – mostly yearly. Companies have to decide which food safety standard they will choose and this is depending where in supply chain they would like to start or where in the food supply chain they are situated. There are different certification schemes available to the companies. The key differences involve where the company is in the supply chain (primary producer, manufacturer, logistics/transport and so forth), its product sector (aquaculture, produce, meat, poultry etc.) and also the scope of its business (local versus international trade) (Figure 1).

Figure 1. Different schemes of food safety standard



Source: adapted from GFSR, 2015

Today in food supply chain network one can see various systems and standards that have been developed during last decade. Worldwide best known standards are Hazard analysis critical control point (HACCP) system, ISO 22000 standard and the British Retail Consortium (BRC) standard. Standard like HACCP is developed to manage potential risks for food safety while standards *like ISO 22000 and BRC normally include HACCP aspects and besides that provide a management system to incorporate food safety in an organization.* (Ackerman et al, 2010: 870)

Choosing a food safety standard is not easy to do. Choice depends on where the company is situated in relation to final buyer and consumer so there are four main "places" in the supply chain for which company can be certified according to the different standards such as primary food production and food safety on farms – SQF Code, CanadaGAP, Global G.A.P; food manufacturing – SQF Code, BRC Food Safety Standard, FSSC 22000, Global Aquaculture Alliance BAP, Global Red Meat Standard, International Food Standard, Synergy 22000; Standards for food packaging – BRC IOP Global Standard for Packing and Packaging Products, IFS PACsecure Standard and Standards for food labeling - Gluten Free Certification Program (Canada) and Food Allergen Labelling, Legislated by Governments. (Bliska and Kovalski, 2014; DNV 2015; GSFI, 2015)

Gawron and Theuvsen (2006) noticed that one of the most often mentioned complaints about food safety standards are huge bureaucratic efforts and work and therefore there is an open discussion if the certification according to one of the above mentioned standards is increasing competitiveness together with increasing safety in food supply chain or not. Henson (2008) in is work looked upon food standards that are currently present in the world food production and food supply chain and he divided standards into two main groups: public and private food standards. Majority of these private standards are created by different commercial and non-commercial entities. Extent, to which private standards are voluntary, significantly depends on level of power wielded by companies that are adopting standards (Brunsson and Jacobsson, 2000). Henson and Humphrey (2009) in their work found that in every group of standards (public and private) there are the ones that are mandatory and the ones that are voluntary for companies (Table 1).

Table 1. Forms of standards

	Public	Private
Mandatory	Regulations	Legally-mandated private standards
Voluntary	Public voluntary standards	Private voluntary standards

Source: adapted from Henson and Humphrey (2009)

Table 2. Private and public standards in the world

		Public		Private	
		Mandatory	Voluntary	Collective	B2B
Focus	National	National legislation	• Food Safety Enhancement Program • HACCP Advantage	• Dutch HACCP • BRC Global Standard • Assured Food Standard • Qualitat and Sicherheit • Integrale Keten Beheersing	• Nature's Choice (TESCO stores UK) • Field-to-Fork (Marks and Spencer UK) • Filiere Agriculture Raisonnee (Auchan Franche) • Filiere Qualite (Carrefour France) • Terre et Saveur (Casino)

	International	EU regulation	ISO 9000 ISO 22000	• International Food Standard • SQF 1000/2000/3000 • EUREPGAP	Wall-Mart Nestle

Source: adapted from Henson, (2008: 73)

Table 2 shows main world food standards according to the group they belong to. Henson (2008) has identified that standards are being developed not only because of safety in food supply chain but because of wider food quality attributes. Although one can see evolution of different private food quality and safety standards for governance of global supply chain of agricultural and food products, there are debates on how much impact on trade private standards have and also how strong is public regulation on national levels of such standards (Garcia Martinez and Pole, 2004).

In the following chapter we will describe International Food Standard (IFS) as one of the most developed and present private collective food quality and safety standards.

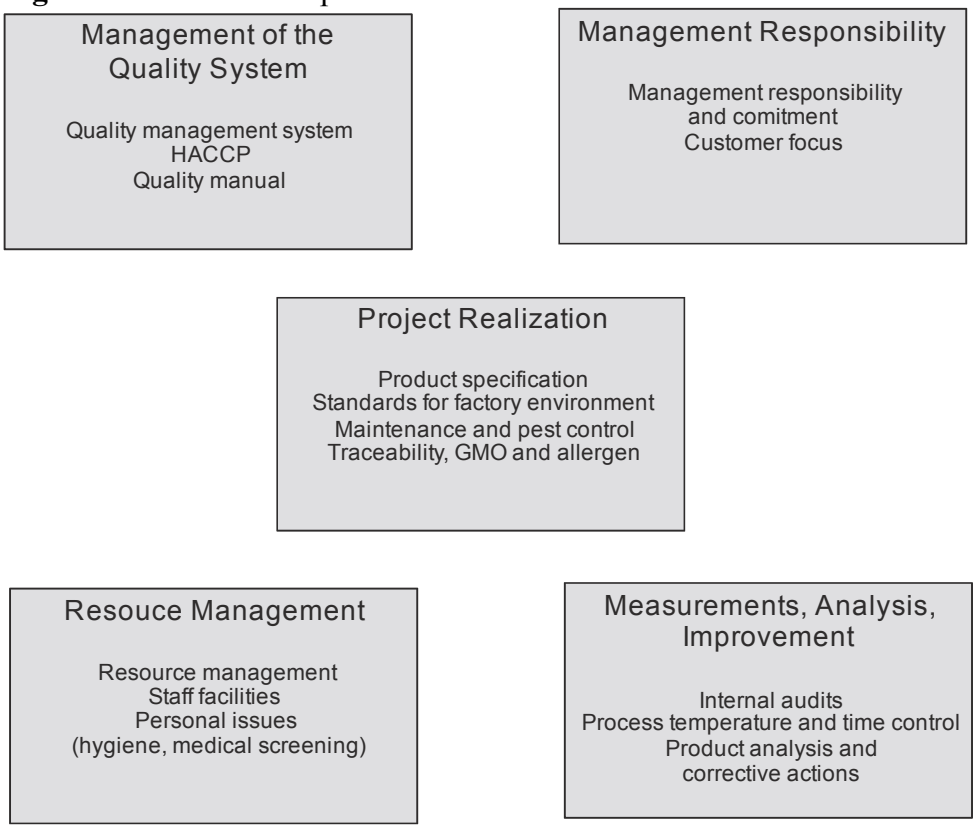
2.2. International food standard

International food standard (IFS) is a food safety standard which has uniform safety system that is used to qualify and select suppliers (DNV, 2015). It can be explained as one common audit standard, globally accepted by the food industry in order to continuously improve food safety for consumers. Standard helps supermarket chains in ensuring food safety of the product they are selling to their buyers and to monitor quality level of suppliers of their private labels. International Food Standard has been developed for the purposes of auditing suppliers who cooperate with networks of so called private label manufacturers. Growing concerns among biggest retailers and supermarket chains regarding food safety of the products they are selling was the main reason why was IFS developed by German and French food trade associations. Standard is intended for all suppliers during food supply chain network from agricultural stage to supermarket chains. The main aim of the IFS standard is to confirm whether the supplier is capable of delivering a safe product compliant with valid law regulations and norms. Standard helps in ensuring that the companies comply with quality and safety demands, and legal requirements. Smieciuch et al (2009) stated that lowering of the costs related to the behavior transparency of the supply chain is one of the essential aspects of IFS.

Furthermore, the IFS introduced uniform requirements and transparency in the supply chain (of raw materials and the final product). The IFS standard is based on the principles of a quality management system as well as the HACCP system and is supported by the expectations for prerequisite programs, which is the set of Good Manufacturing Practices (GMP), Good Hygienic Practices (GMP) and Good Laboratory Practices (GLP). The IFS also follows the guidelines of the Global Food Safety Initiative and meets criteria set by GFSI – organization that includes senior management of more than 400 retailers and supermarket chains operating on close to 200.000 store and manufacturers of all sizes (Bliska and Kowalski, 2014).

Structure of IFS is similar to the structure of ISO 9001 and it is base for the audits of the company (Figure 2). It consists of the main technical chapters are management of the quality system, management responsibility, resource management and product realization, measurement s, analyses and improvements

Figure 2. Technical chapters of IFS standard



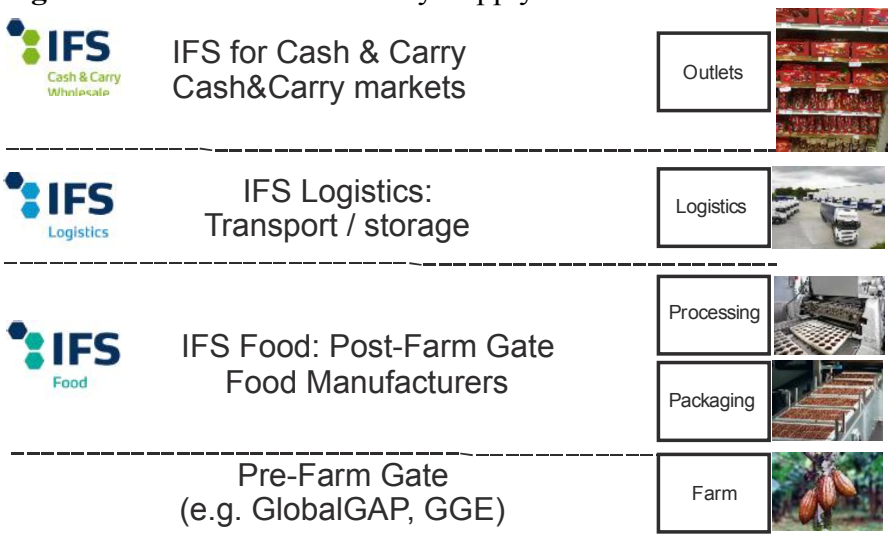
Source: adapted from Gawron J-C., Theuvsen, L., 2006: 5

IFS enable organization that is certified (DNV, 2015; Gawron and Theuvsen 2006) to:

- Have proof of commitment to the food safety in its supply chain and in case of need legal defense,
- Create management system that is capable for meeting food safety supply chain requirements and legal compliance that is applicable in countries where the products are sold and consumed,
- Have a tool for improving food safety supply chains and tools to observes and measure performance of current food supply chain network,
- Reduce product waste, product reworking and product recall – reduce costs of business.

Due to the need for certification of the whole food supply chain companies can be certified according to the different parts of the IFS for its different parts and roles in food safety supply chain (Figure 3.).

Figure 3. IFS in the Food Safety Supply Chain



Source: adapted from ANSICA, 2015

IFS Food was the first standard in the IFS standard family and now is the most widely used standard from IFS family. This is confirmed by more than 11.000 IFS Food audits which were conducted in over 96 countries in 2010 and that numbers are growing (IFS, 2011). IFS Logistics is developed for distribution, transportation, loading and unloading activities, storage and is intended for implementation in environments that are managing food and non-food products. It marks objective of industry and trade in creating transparency and trust in entire food supply chain. In order to optimize procedures of audits in cash & carry locations and wholesalers IFS Cash & Carry / Wholesale standard was developed. This two business types are important connectors between primary producers, converters and commercial clients. This business also need standard because they can process small amount of unpacked products alongside to their wide assortment of other products. Besides this three main IFS standards, companies can be certified for IFS PacSecure (packaging materials suppliers), IFS Broker, IFS HPC (Household and cosmetic products) depending on their role and place in food safety supply chain and also based on their business.

3. BENEFITS OF INTERNATIONAL FOOD STANDARD FOR CERTIFIED COMPANIES

Companies see calls for safety in food supply chain network as their opportunity for continuous innovations and competitiveness. Hofstede (2003) found, enabling logistics and process improvements along the supply chain and having important consequences to a liability as direct benefits of certification

IFS can be looked as a neutral instrument based on third party audits which can decrease costs and improve quality of final products at the same time (Buhlmann et al, 2004). Therefore standard has been largely accepted in the Western European retail sector (France and Germany) and is becoming a certification standard not only for private labels but also for manufacturer brands (Gawron and Theuvsen, 2006). As a

result of this more and more food producers are replacing ISO standard with IFS. Smieciuch et al (2009) stated that main benefits for companies having IFS are growth of efficiency, effectiveness in production, increasing trust in product safety and lastly transparency of behavior and better acceptance of customers.

Certification in accordance to IFS offers benefits to companies which mission includes excellence in quality, customer satisfaction and trying to have a competitive advantage in global marketplace.

Table 3. Key IFS benefits

<table>
<tr><th>Purchasing</th><th>Production</th><th>Marketing</th></tr>
<tr><td>Improved confidence in suppliers and products</td><td>Improved understanding between management and staff relating to standards and procedures</td><td>Improved business reputation as a supplier of high-quality product</td></tr>
<tr><td>Reduced time spent on supplier screening</td><td>Monitoring of compliance with food regulations</td><td>Ability to trade with customers insisting on independent inspection</td></tr>
<tr><td>Less time spent reworking or returning product outside specification</td><td>More effective use of resources</td><td rowspan="6">Use of the IFS logo and certificate to demonstrate compliance with the highest standards</td></tr>
<tr><td>Due diligence defence</td><td>Reduction in the need for customer inspections</td></tr>
<tr><td>Expert witness</td><td>Due diligence defence</td></tr>
<tr><td rowspan="2">Ability to reduce individual inspection costs by combining a variety of different inspections at the same time</td><td>Expert witness</td></tr>
<tr><td>Ability to reduce total inspection time by combining a variety of different inspections at the same time</td></tr>
</table>

Source: adapted from SAI Global, 2015

Other authors (Garcia Martinez and Poole, 2004; Ackerman et al, 2010) stated additional benefits of IFS standard for companies – possibility to achieve higher level of food safety and quality, standard is clearly structured and precisely written and gives companies a fair chance for sustainable improvements in the processes. On the other side it is important to state some contras to the private standards among which is IFS. Jackson (2008) stated following contras – standard is a "trade barrier" – for a potential new competitors on the market, standard is not transparent and not science based, they present additional cost to suppliers and producers, customer is King and can ask everything they want from suppliers.

Probably the biggest benefit coming from IFS is that is accepted by major retailers like Metro Group, Edeka, Rewe Group, Aldi, Lidl, Auchan, Carrefour Group, Leclerc, Provera (Cora and Supermarchés Match), Système U, COOP, CONAD and others. This means that the company that has IFS certificate can produce private labels

and can be a partner to this retailers and this give company competitive advantage in relation to the companies that don't have this certificate. This competitive advantage is huge benefit in today's global and increasingly competitive marketplace for company that has it. Certificate also ensures retailers that the certified company has food safety supply chain settled and that his food safety can be trusted and that there is no need for additional audits from retailers themselves.

4. CROATIAN CHOCOLATE PRODUCER KANDIT D.O.O. AND FOOD SAFETY STANDARD

4.1. Company background

Kandit d.o.o. has been founded in 1905 as a sugar factory. In the 1920-ties company started with production of candies and confectionery. After the second world Kandit produced first chocolate. In 1960-ties Kandit became one of the leading manufacturers of confectionery products in former Yugoslavia. During last several years Kandit has invested in modernization of production and in 2009 started production of foamy products.

In 2011 Kandit became a member of Mepas group together with Saponia, Brodomerkur, Koestlin and Maraska. During 2012 Kandit has started building of new modern factory which was finished in June 2014 and soon afterward production has been completely moved to the new location. More than 20 million EUR has been invested in the new factory – building and equipment.

Company currently has around 350 employees and has recorded a growth in sales during Q1 2015 in relation to the same period of the previous year.

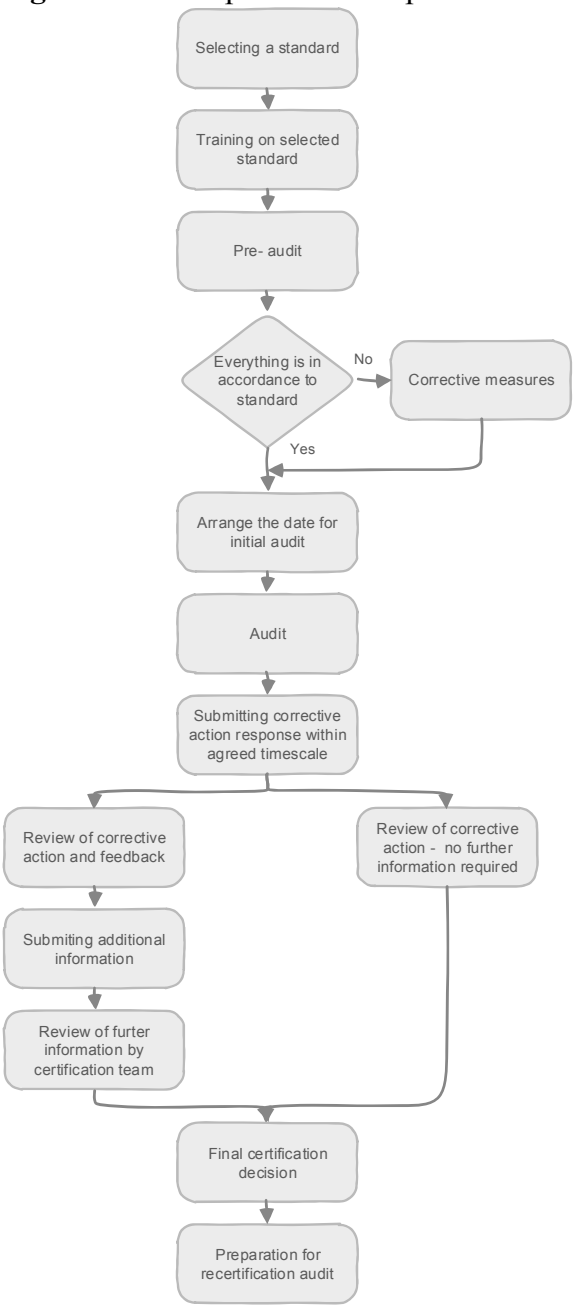
4.2. Implementation of IFS in Kandit

Kandit has started to produce private label products for several foreign companies including Lidl, Lela and Rewe group (Billa). Previously Kandit has passed certification for ISO 9000 (quality management) and HACCP (food security management) and has been recertified for both standards several times. Besides this two certificates Kandit hold Kosher and UTZ certificate. UTZ is largest program for sustainable farming of coffee and cocoa in the world. The UTZ Certified program covers good agricultural practices, farm management, social and living conditions, and the environment.

Until 2013 there were no additional demands from buyers except agreed price and quality. But due to the bigger competition on global market and increasing of concern for the food safety supply chain, buyers like Lidl and Lela started to demand additional quality and security demands. This was first done through additional food safety audits which were performed by buyers themselves. They suggested that Kandit should start certification process for IFS standard in order to remain their chocolates supplier and in order to be able to offer its products to the other retailers to whom Kandit wasn't able to sell without this standard.

Managing board of the Kandit founded certification team which started IFS implementation process in October 2014. (Figure 4) During certification process members of certification team and whole Kandit prepared and increased food safety supply chain in Kandit. This was done through investments in production (i.e. replacing wooden pallets with plastic ones, replacing wooden elements with plastic or metal ones, etc.). There were other investments as well especially in the field of workers education about their role in food safety supply chain – what to do and how to improve safety with their behavior. Implementation process has finished in January 2015 when Kandit successfully passed certification audit for IFS Food.

Figure 4. IFS implementation process in Kandit



Source: author, 2015

Figure 4 is showing process of IFS implementation in Kandit. Before starting management had to decide which standard to implement and next phase was creating certification team and education of team members about IFS. After education and preparation pre-audit was done in order to see what is in accordance with standard and what has to be improved. Next step was audit itself which has lasted for three days. At the end of every day members of certification team had a meeting with audit team members in order to check daily progress and if there are some slight improvements to be done – if there are big and huge faults company would not be certified and will have to wait at least six months before it applies for another audit. After the certification audit has passed audit team members informed members of the board that company has got the IFS certificate. For Kandit this meant open door for supplying big retailers with chocolate and for retailers that they will received Kandit's products via safe food supply chain.

4.3. IFS and transport requirements in Kandit's supply chain

In several departments in Kandit besides production there was additional activities implemented all in order to increase food safety in supply chain. One of those departments was transport and logistics in order to prepare transport demands of IFS and transport of the final products – chocolates. Safe transport should be an assurance for buyers and consumers that the products will be suitable for consumption when they reach final destination. Different food industries influence the transport in diverse ways. Food transport is influenced by weather conditions and therefore additional efforts should be implemented in accordance to IFS to ensure food safety in the supply chain. It is important to state the IFS in its quality demands have a section which deals with transport and logistics

Transport of the chocolates had to be improved in order to match following conditions: means of transportation have to be kept in food technical conditions, loading surface of vehicle should be adapted to transporting chocolates, temperature of transport should be 12-18°C, etc. As part of these efforts, Kandit has invested in improving transportation means and bought refrigerator truck in order to be better supplier for its customers. Additionally during the transport it is necessary to maintain quality by keeping constant temperature, maintain hygiene regarding biological contamination, and apply protection during transport and watching over refrigerator truck quality and status.

Special procedures were developed for critical situations in order to prevent chocolate transport failures. These situations can be divided in three groups: vehicle failure, road accident and damage to the chocolates during transport. Procedures describe way of how it should reacted in case of vehicle failure – how to protect chocolates, how to contact customer and how to eliminate possible damages to chocolates; in case of road accident – how to contact producer, how to contact buyer, how to organize replacement transportation in case that the original in not able to continue or to keep the chocolate safe. In case of product damage during transport procedure states following steps: driver informs customer service and logistic about damaged chocolate products; customer service department decides how to proceed – deliver goods to consignee or return to the Kandit warehouse; new set of sales

documents is created in relation to the updated status of transported chocolates. Procedures and actions are also in place in cases when the transport of chocolates is forwarded to external transportation company – in transport order it is mentioned that the transporter has to follow principles of IFS for transport of the chocolate. In this way chocolate producer have control over food safety in supply chain during transport from production site to the external warehouse or to the buyer of chocolates.

5. CONCLUSION

Safety in food supply chain is important in today's food production and process of bringing food from producer to the final users. Functionality of food safety in supply chain should and has to cover safety and quality assurance. Prevention of safety issues is of the most critical importance because just one problem which reaches final consumers can have significant health and financial consequences for the producer. Food safety in supply chain is focused more on prevention than reaction because it has lower costs and helps companies to be better and more competitive on global market.

International Food Standard is one of the available world food safety supply chain standards companies can choose in order to be certified and to have safe supply chain. This standard has several benefits for the companies that finish certification process but the most important one is the certified company can produce private labels for retailers which increase company's competitiveness in in today's global marketplace.

After being IFS certified Kandit gained advantage in relation to its competitors but it had to invest in getting standard in all supply chain starting from suppliers through transport and logistic until its buyers.

Influence of IFS on company food safety supply chain is significant and can be costly due to the necessary changes but in the same time it can save money and increase sales. Since there is not a lot of companies in Croatia that are IFS certified it will need some time and further research to prove how exactly IFS is influencing food supply chain of the certified companies.

6. REFERENCES

Ackerman, R., Farahani, P., Grunow, M. (2010). Quality, safety and sustainability in food distribution: a review of quantitative operations management approaches and challenges, QR Spectrum, 32, p. 863-904.

ANSICA, (2015). IFS - The biggest success is always based on simple principles, PowerPoint presentation, [available at: https://www.ansica.org/wwwversion/ANSICAfiles/KnowledgeBaseFile/PowerPoinPresentation.ppt, access April 22, 2015]

Beulens, A. J. M., Broens, D-F., Folstar, P., Hofstede G. J. (2005). Food safety and transparency in food chains and networks - Relationships and challenges, Food Control, Vol. 16, p. 481-486.

Bliska, A., Kowalski, R. (2014). Food Quality and Safety Management, *Logforum – Scientific Journal of Logistics,* 10 (3), p. 351-361.

Brunson, N., Jacobsson, B. (2000). A World of Standards, Oxford University Press

Buhlmann, B. et al (2004). Kompaktwissen zum IFS: Anforderungen, Umsetzung und Erfahrungsberichte zur Version 4. 2nd ed., Behr's Verlag, Hamburg.

DNV (2015). IFS – International Food Standard [available at: http://www.dnv.in/industry/food_bev/services_solutions/food_safety/primary_production/ifs_international_food_standard.asp, access April 22, 2015]

Gawron, J-C., Theuvsen, L. (2006). The International Food Standard: Bureaucratic Burden or Helpful Management Instrument in Global Markets? - Empirical Results from the German Food Industry, paper presented at the 98th EAAE Seminar "Marketing Dynamics within the Global Trading System: New Perspectives", Chania, Crete, Greece, June, 29 – July, 2.

Garcia Martinez, M., Poole, N. (2004). The development of private fresh produce safety standards: implications for developing Mediterranean exporting countries, *Food Policy*, 29, p. 229-255.

GFSI (2015). What is GFSI [available at: http://www.mygfsi.com/about-us/about-gfsi/what-is-gfsi.html, access April 22, 2015]

Global Food Safety Resource (2015). Introduction to Food Safety Standards [available at: http://globalfoodsafetyresource.com/food-safety/food-safety/food-safety-standards, access April 27, 2015]

Henson, S. (2008). The Role of Public and Private Standards in Regulating International Food Markets, *Journal of International Agricultural Trade and Development,* 4(1), p. 63-81.

Henson, S., Humphrey, J. (2009). The Impacts of Private Food Safety Standards on the Food Chain and on Public Standard-Setting Processes, paper prepared for FAO/WHO, Codex Alimentarius Commission, 32nd session, Rome, Italy.

Hostede, G. J. (2003). Trust and transparency in supply netchains: a contradiction? in Proceedings of 8th Conference AIM, Grenoble, May 2003.

IFS Management (2011). International Featured Standards (IFS) – Structures and contents are growing with international success, IFS News – IFS Food 6, [available at: http://www.ifs-certification.com/images/downloads/en/ifs_news_food6_english.pdf, access May 10, 2015]

Jackson, L. (2008). Food safety standards – equivalent or not, paper presented at 4th IAFP European Symposium on Food Safety, Lisbon, 19-21 November.

NSF (2015). Global Food Safety Initiative (GFSI) Certification [available at: http://www.nsf.org/services/by-industry/food-safety-quality/global-food-safety-certification/, access April 22, 2015]

SAI Global (2015). International Food Standard (IFS), [available at: https://www.saiglobal.com/assurance/food-safety/ifs.htm, access May 5, 2015]

Smieciuch, J., Dmowski, A., Niewczas, A. (2009). Management Systems for the Safe Transportation of Food in the Light of National and International Standards, in Proceedings of the 6th International Scientific Conference TRANSBALTICA 2009