

# Food safety in Croatia - background and challenges

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scientific paper

## Summary

The governance of food safety in Croatia has evolved significantly in the past two decades. The evolution has affected the way in which food safety is assured globally. Food safety assurance is achieved through two main ways: statutory regulation and private regulation. Statutory regulations for food control primarily protect the health of consumers and spell out behaviours, mechanisms for enforcing them, and sanctions that should be applied. Private regulation of food safety is linked to the trend of major retailer. Most of the standards are similar in the sense that they all have one main objective: to protect consumer health through an integrated process-based food safety management, achieved through specifying the basic minimum requirements acceptable for food safety and third party audits. This article provides information and describes the current situation of food safety assurance schemes in Croatia. It contains legislations related to food safety and quality, infrastructure of food safety assurance schemes, information about main institution and information about the current situation of food quality assurance indicators.

**Key words:** Food safety, Croatia, food regulation, food standard

## Introduction

Food placed on the market must be safe for consumption, must have good quality and not cause human diseases. There are numerous articles on the impact of food safety regulations on businesses and the challenges in their implementation in different countries and sectors (Havinga, 2008; Karlsen and Olsen, 2011; Mensah and Julien, 2011). Over the past few decades there has been a change in the way how we think about food safety. The control of products at the end of the production process has been shifted to prevention (Van Asselt *et al.*, 2010). This upgrade in perspective is often characterised as a change from product controls to process controls. Responsibility for food safety and product quality is no longer just the responsibility of official institutions and inspections; the main responsibility is on food producers.

Food safety, nationally and internationally, is managed and ensured by private and public sector efforts

(Mensah and Julien, 2011; Trall & Koenig, 2010). The private sector has strong incentives to prevent food safety crises and to mitigate their impact if they arise. Firms implicated in a crisis may suffer from reputation lost, stock prices reduced, plants closed for clean-up or permanently shut down, food poisoning lawsuits filed, premiums raised for product liability insurance, and demand for product reduced enough to threaten entire markets or industries (BUZBY, 2003). In general, the private sector pioneers food safety advances. In addition to private sector approaches, government regulation is necessary to ensure food safety.

Recent developments recognised the role of consumers. According to Robach (2010), over the past two decades many consumers have become more concerned about food safety and other aspects of the food which they consume. Communication with the consumer is an important mission of institution (Barnett *et al.*, 2011; Knežević *et al.*, 2012;

Mensah and Julien, 2011). Consumers provide information to regulators on food safety and contribute to improve food safety and build public confidence in the risk assessments process (European Commission, 2010; Heikkilä *et al.*, 2011; Meyer *et al.*, 2011; Rubil *et al.*, 2008).

Challenges to food safety include pesticide and drug residues, pathogens, food additives, environmental toxins, GM food, food with nano particle, persistent organic pollutants, unconventional agents such as those associated with "mad cow disease" and zoonotic diseases (Marvin *et al.*, 2009; Moris and Kirwan, 2010; Neff *et al.*, 2012; Njari *et al.*, 2012; Knežević *et al.*, 2013). However, the globalization of the food supply could introduce new food safety risks (Jackson & Jansen, 2010; Brückner, 2011). Several crises related to food safety in the last ten years, including epidemics caused by E. coli, BSE, dioxins in Denmark, melamine in China, radioactive contamination in Japan and others, affected many

Table 1: Role of the main institutions in Croatian food safety assurance

Institution	Role in food safety assurance	Main related laws	Official gazette No.
Ministry of Agriculture	Mainly responsible for food safety, animal welfare and agricultural issues	Food act	46/07, 84/08, 55/11
		Veterinary act	41/07, 155/08, 5/11
		Animal health protection and veterinary practice act	52/91, 64/91
		Livestock act	70/97, 36/98, 151/03, 32/06
		Act on organic production and labelling of organic products	139/10
		Act on organization of agricultural markets	149/09, 120/12
Ministry of Health	Responsible for inspection of non-animal food, safety and quality of food for special issues: GMO food, drinking and usage water	Food Act	46/07, 84/08, 55/11
		Act on genetically modified organisms	70/05 i 137/09
		Water Act	153/09 i 130/11
		Law on sanitary inspection	113/08 i 88/10
Croatia Food Agency	Responsible for emerging risks identification, risk assessments and report of risk assessment results related to food safety	Food act	46/07, 84/08, 55/11
State Inspectorate	Responsible for inspection in the field of trade, catering and providing services in tourism	Food act	46/07, 84/08, 55/11
		Consumer protection act	79/07, 125/07, 79/09, 89/09
		State inspection act	116/08, 123/08
Croatian Institute for standardisation (HZN)	Responsible for the preparation of Croatian food standards	Standardization Act	63/03

Table 2: Notification in the EU RASFF system related to the non-conforming products originated from Croatian (Source: made by authors based on data of EUROPEAN COMMISSION, 2012)

Year	Nonconform.
2008	18
2009	29
2010	19
2011	12

countries and encourage the comprehensive reform and consolidate their systems responsible for the control of imported food. The legal consolidation involves improving the efficiency of inspections through the control consistently and clearly defined responsibilities (Marucheck *et al.*, 2011; Zach *et al.*, 2012).

Food and beverages industry in Croatia forms a large part of the economy. According to Croatian Bureau of Statistics they are generating 23.5 billion HRK (4.5 billion USD), that

represents about 24.3 % of manufacturing output (Anon, 2012a). The capacity of this industry is sufficient to satisfy the needs of the domestic market and the usage of production capacities for food is 75% and for beverages 79% (FAO, 2011). The imported agricultural and food products in 2011 amounts 2.2 billion USD and in comparison to the previous year, the import value increased by 4%. Exports of agricultural and food products generated 1.4 billion USD and food export in the total export share is 12% (Anon, 2012a).

This article reports the first stage of work being undertaken to understand factors that have been impacted on the current state of food safety in the Croatian food manufacturing sector. It elaborates the governance structure of food quality assurance in Croatia which includes public and private institutes, laws and legislations in a broad based perspective and research on food quality issues.

## Regulations and institution related to food safety

Legislation in the field of food security has changed significantly in last few years in the EU and in Croatia, too. Food safety approach is completely altered. New legislation covers the entire production chain, starting from the fields or farms on which the animals are bred, to food production or consumer. A new approach to food safety set by the adoption of the European Regulation (EC) 178/2002 on general foreheads and requirements of food law establishing the European Food Safety Authority (EFSA) and laying down procedures in matters of food safety (European Commission, 2002). Croatia as a candidate country had an obligation to harmonize legislation with existing legislation in the European Union.

Croatian Food Act (Anon, 2007) provides general provisions of food, prescribes requirements and re-

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sponsibilities for food and feed safety and establishes a system of official controls, laboratory procedures, crisis management, rapid alert system and hygiene of food and feed. The Food Act also laid down the general requirements of quality and labelling of food and feed, as well as general requirements for food and feed containing or consisting of or produced from genetically modified organisms. It must be noted that under the provisions of the Food Act, food operators are primarily responsible for food at all stages of production, processing and distribution under their control. The key provision of Food Act that mainly influences food safety control system is mandatory introduction of self-control system based on the principles of the Hazard Analysis and Critical Control Point (HACCP) for all objects in the food, except at the level of primary production, and the obligation of good hygiene practices for all facilities including primary production.

According to the provisions of Food law, Ministry of Agriculture is central government body responsible for the safety, hygiene and quality of food and feed for animals and for the organization of official controls and a contact point to the European Commission (Table 1). Croatia Food Agency is established by the Food Act and is responsible to identify emerging risks, make risk assessments and report on risk assessment results related to health, safety and hygiene of food and feed (Gross Bošković *et al.*, 2012). Addition to the Ministry of Agriculture, there are Ministry of Health, the State Inspection and other institutions in Croatia, which cooperates for the purpose of placing on the market safe and secure food.

Croatia has also been a contractor in a series of international agreements related to fair trade rules since 1991. Croatia is a member of the Co-



Figure 1: Number of issued certificates ISO 9001, ISO 22 000, HACCP, BRC/IFS in Croatia by year (Source: made by authors based on data from ANON, 2011)

Table 3: Microbiological and chemical safety of food samples analysed in Croatian Public Health Institutions (Source: made by authors based on data from ANON, 2012b)

Year	Microbiological safety			Chemical safety			Total		
	Sample number	Nonconform.	% nonconform.	Sample number	Nonconform.	% nonconform.	Sample number	Nonconform.	% nonconform.
2008	43543	2423	5,56	26968	1024	3,80	70511	3447	4,89
2009	36270	2471	6,81	22035	923	4,19	58305	3394	5,82
2010	34373	2393	6,96	20662	804	3,89	55035	3197	5,81
2011	36435	2456	6,74	18479	544	2,14	54914	3000	5,46

dex Alimentarius Commission and International Organisation of Standardization (ISO). Issues of protection of human health in general and in particular from food-borne risks are covered by Food Act and also by Veterinary Act, Animal Welfare Act, the Livestock Act and Consumer Protection Act. Croatia has adopted implementing secondary legislation aligned with the EU requirements in all sectors. The Ordinance on the rapid alert system for food and feed has been created and the efficient system of consumer protection in line with all the international standards has been developed.

#### Standards of food safety

Quality assurance system and food safety in food businesses consists of two parallel systems. On the one side, the system is organized by the state and is based on the regulations

that defines ways of establishing the system of quality assurance and perform official inspections control. On the other hand, there is quality assurance system based on standards that are defined and adopted by international associations. These standards are voluntary and completely guided by market regularities. Application of certain standards imposed on Croatian food producers and distributors new requirements. These requirements are enforced primarily by large retail chains and consumer requests.

Croatian Institute for Standardisation (HZN) as the national body or standards promotes and develops national standardization activity. The strategy for the implementation of rules in the free movement of goods established the obligation to adopt all European standards in

the Croatian standardization system. Ensuring food security in a Croatian market consists of additional voluntary instruments:

- Guides to good practice - at the national level as a guide for operators of food sector;
- ISO standards - EN 22000 Food safety management system, Requirements for any organization in the food chain, ISO 22005 Traceability in the food chain to humans and animals, General principles and basic requirements for the design and implementation of the system, ISO 9001
- Requirements for quality management system. These are voluntary instruments for food operators and certification is conducted by special certification bodies. They can help companies in the food sector in defence of their own due diligence.
- Private standards - such as the International Food Standards (IFS), British retail standard (BRC). These standards set special conditions that determine some retailers to prove liability for products with private label. Some global food producers can also ask their suppliers to implement these or similar standards.
- Religious standards - some religious communities bring their standards, such as the Halal standard as well as specific requirements asked for Kosher food.

Although the implementation of some standards require a lot of time (up to three years), survey in Croatia led to the fact that more than 70% of surveyed companies have 2-3 different certificates for quality or food safety and many are considering the implementation of new certificates (Gajdić & Škrlec, 2010). At the end of 2010 Croatia had 2861 certificates according to ISO 9001 and 105 certificate according to ISO 22000 (Figure 1) (Anon, 2011). It is not always clear whether all of these benefits

are realized in the market due to the influence of many other factors that effects on behaviour of markets and market principles (Dumičić and Gajdić, 2011; ISO, 2011). However, it is clear that the main goals of standards for quality management and food safety in the food industry is to ensure healthy food on the market and to improve customer satisfaction, which is a prerequisite for long-term survival in the market. They provide a framework for uniformity in requirements, audit procedures and mutual acceptance of audits and reassure retailers and branded manufacturers of the capability and competence of suppliers.

#### Food safety through EU RASFF and Croatian Public Health Institutions

Pursuant to Regulation 178/2002 European Commission established the Rapid Alert System for Food and Feed (RASFF) to exchange information on potentially dangerous products in all countries of the European Union. Its value is as a key tool in the cross-border flow of goods and as a source of information for the official institutions that deal with food and feed and the European Commission. Thanks to RASFF, many food safety risks are avoided before they could harm consumers. This exchange of information helps Member States to act quickly and coordinated through a simple system consisting of a clearly defined point of contact (European Commission, 2011). Croatia is also part of the EU RASFF system and has defined the national contact point through which information are being sent if on the EU market is found improper food from Croatia.

In 2011 in EU were a total of 9157 notifications, of which 3 812 original notice of which 635 are classified as warning, 573 for follow-up information, 744 as information for the care and 1 860 as a border rejection (European Commission, 2012). Most

notices were related to the problems related to mycotoxins (631), pathogens (599) and pesticides (363). By food categories, the highest number of notifications was observed in fish and fish products (491), followed by materials that come in contact with food (311) and substances for animal feed (261). Most notification related to products originates are from China, India and Turkey. Notifications number relating to products originated from Croatia is showed in Table 2. It is evident that the number of notifications decreases from 2009 to 2011 and this is confirmation that the new legislation and an increasing number of companies with private standards has positive effect on food safety system.

Efficiency of the Croatian food safety system can be monitored through a number of nonconforming samples collected at official controls. According to the Croatian National Institute of Public Health (Anon, 2012b) the total number of microbiologically and chemically tested food samples from 2008 to 2011 at the several Croatian Public Health Institution decreases from year to year from 70511 in year 2008 to 54914 in 2011 but proportion of non-conforming samples is similar (between 4,89 % and 5,46%) (Table 3). It is important to note that the share of microbiological non-conforming products slightly increases (from 5,56% to 6,74%) and chemical nonconformity record is slightly decreased (from 3,80% to 2,14%). Based on the annual reports of the Croatian Food Agency, the most often in 2011 are microbiological nonconformities in food due to high content of enterobacteria, campylobacter, total aerobic mesophilic bacteria, coagulase positive staphylococci, salmonella, yeasts and molds (Anon, 2013).

Obviously that new systems of control and self-control have had

good results and food safety in Croatia is on the same level as in European Union. But still remains the biggest problem of microbiological hazards in foods as is the case in all other countries.

### Conclusions

Croatia has formally adopted a number of typical elements of food safety regulations and control systems in the accession period to the EU. Food safety control in Croatia at the present combines both integrated process-based approaches (e.g. accreditation, regular audits, assessments by third party auditors) for food safety management and performance based approaches (e.g. inspection, sample testing, end-product testing). An effective and efficient control and management for food safety requires the concerted efforts of industry, government regulators, scientists and consumers.

The changing landscape of food safety has put increased pressure on laboratories used for analysing products for food safety and third party auditing bodies. There has been a trend toward 'accreditation' of laboratories and third party auditing bodies as process by which conformity assessment bodies are examined for independence, competence and skills.

The EU accession process supports development of food safety system in Croatia and its continuation will be an important driver in the coming years. Long-term impact of EU accession can be that the increased market access to the EU could generate a significant increase in demand, in both quantity and quality that would support significant growth of agricultural and food sectors in Croatia. Future research may focus on supply chain analysis and obstacles to collaboration between key actors, consumer response to quality in domestic markets and on a model to

prevent small scale producers being excluded from dynamic markets.

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## Nahrungssicherheit in Kroatien – Hintergrund und Herausforderungen

### Zusammenfassung

Die Verwaltung über die Nahrungssicherheit in Kroatien hat in den letzten zwei Jahrzehnten bedeutende Fortschritte gemacht. Die bezüglichen Veränderungen haben einen Einfluss auf die Versicherungsart der Nahrungssicherheit auf globaler Ebene gehabt. Die Nahrungssicherheit wird durch zwei Grundweisen erreicht: durch gesetzliche Regulative und private Regulation. Durch gesetzliche Vorschriften über gesundheitliche Nahrungssicherheit und Kontrolle wird in erster Linie die Verbrauchergesundheit geschützt, es wird auch auf die Durchführungsmechanismen, sowie auf Sanktionen die im gegebenen Fall angewendet werden müssen, hingewiesen. Die Privatregulation in Bezug auf die Nahrungssicherheit ist mit dem Trend verbunden, der bei großen Ketten überwiegt. Er sieht die Einführung verschiedener Normen voraus. Die meisten Normen sind ähnlich und haben ein gemeinsames Hauptziel: Verbraucherschutz durch einen integrierten Prozess, der auf der Verwaltung über die Nahrungssicherheit gründet, weiterhin die Erreichung der minimalen Grundbedingungen, annehmbar für die Nahrungssicherheit, sowie Audits von dritter Seite. Dieser Artikel gibt Informationen und beschreibt die momentane Nahrungssicherheitssituation in Kroatien. Gegeben sind gesetzliche Vorschriften hinsichtlich der Nahrungssicherheit, Qualität der Infrastruktur, Versicherungsschemen der Nahrungssicherheit, Informationen über die Hauptinstitutionen und augenblicklichen Stand sowie Indikatoren der Nahrungssicherheit.

**Schlüsselwörter:** Nahrungssicherheit, Kroatien, Nahrung, Ernährungsnormen

## Sicurezza alimentare in Croazia – sfondo e sfide

### Sommario

Il sistema di gestione della sicurezza alimentare in Croazia è notevolmente migliorato negli ultimi due decenni. I cambiamenti hanno avuto influenza sulla sicurezza alimentare a livello globale. La sicurezza alimentare si ottiene mediante due principi fondamentali: regolazione legislativa e regolazione privata. Le prescrizioni legali sulla sorveglianza sanitaria e sul controllo degli alimenti proteggono in primo luogo la salute dei consumatori, indicando i meccanismi di esecuzione e sanzione applicata in caso di bisogno. La regolazione privata della sicurezza alimentare è legata al trend che predomina nelle grandi catene di negozi e rappresenta l'introduzione delle varie norme. La maggior parte delle normative è simile e tutte le normative hanno lo stesso scopo: la tutela del consumatore per mezzo di un processo integrato basato sulla gestione della sicurezza alimentare, il raggiungimento delle condizioni minime accettabili per la sicurezza alimentare e per i fornitori di terza parte. Il presente articolo fornisce informazioni e descrive la situazione attuale della sicurezza alimentare in Croazia. Sono indicate le prescrizioni legali relative alla sicurezza alimentare e qualità dell'infrastruttura, i modelli di gestione della sicurezza alimentare, gli indicatori della qualità degli alimenti, le informazioni sulle principali istituzioni e sulla situazione attuale e gli indicatori della qualità degli alimenti.

**Parole chiave:** sicurezza alimentare, Croazia, alimenti, regolamenti alimentari

August 30 to September 2, Zurich, Switzerland. Accessed on: [http://ageconsearch.umn.edu/bitstream/114551/2/Heikkilae\\_Jaakko\\_77.pdf](http://ageconsearch.umn.edu/bitstream/114551/2/Heikkilae_Jaakko_77.pdf).

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Received: 17 April 2013  
Accepted: 5 June 2013