**PhD** Thesis

# TRACEABILITY IN THE SERTIAN FOOD INDUSTY SYSTEM IN THE LIGHT OF LAWS AND MANAGEMENT SYSTEMS

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## **Background of the thesis, introduction**

The role of food safety has been a growing concern; it is getting more and more important in the 21st century. Likewise, implementing special traceability systems for the control of products in all stages of the food chain became a bottom line.

The EU's latest food regulation law emphasisez that traceability of food products – from farm to table, namely from the very first stage of processing to the last one, where it reaches the final consumer - should be one of the most important issues (Szeitzné, 2007). Furthermore, the Serbian integration endeavour to the European Union also requires some changes and harmonisation of food safety legal regulations.

When purchasing a food product, traceability means the ability of keeping track of and verifying the history, location, or application (Stojšić et al., 2004) of an item by means of documented recorded identification.

The Socialist Federal Republic of Yugoslavia (SFRY) in the late 20th century had a rather well-developed food safety legal regulatory system applied in food processing. Serbian food industry in general had a strong food export presence. The biggest Serbian meat-packing plants regularly exported (mainly can supplies) to the American market, so they were under constant control by the American Animal Health Authority. The export required a valid and well-established sanitation standard system in food industry that basically stood for "customer audits" as well.

However, the breakup and disintegration of Yugoslavia brought some significant changes to the Serbian food industry. As a result of international economic sanctions and embargoes, food export and import in Serbia fell off to almost minimum. The main consideration was to ease somehow the lack of certain basic foood items, so the need of meeting the requirements of quality and food safety regulations and traceability standards became less important. Therefore, it's not suprising that the 90s law regulations concerning food industry were almost the same or slightly modified versions of the laws being in force in the 70s and 80s in Yugoslavia. The harmonisation process of the respective food trade legislations and regulations with the directives of the European Union and the food standards of the Codex Alimentarius Comission started with a decadelong "delay" in Serbia.

Some major changes in food safety regulations were made only after the millennium, partially thanks to the ongoing negotiations about Serbia's EU membership endavour.

Traceability – as a basic requirement of food safety - was first mentioned in the 2005 Serbian Animal Health Law (Zakon o veterinarstvu). However, according to the Animal Health Law only for the protein-processing plants was it mandatory to apply the HACCP food safety -and traceability system. This changed in 2009 when the new Law of Food Safety (Zakon o bezbednost ihrane) came out and the regulations were spread to the whole food chain and feed. Now being related to the farmers and crop growers as well. Unfortunately, the regulations and bye-laws concerning the Law of Food Safety came into force the regulations had controlled only the prescribed facilities and equipment of plants and had supervised the quality of the final product (only in the last processing stage).

Importantly enough, not only the Animal Health Law and the Law of Food Safety, but the appearance of multinational food chains made the adaptation of food safety and traceability systems extremely important. In addition, there was also a growing pressure on behalf of the customers towards the food producers and distributors. Soon, the leaders of the companies and plants realised that it could be a tool for profitability.

As from 2009 the Serbian Food Safety Authority focused not so much on the content of the required documentation, but the pure existence of it, meeting the customer requirements and needs were getting more and more important. Fortunately, almost all the multinational retail trade chains being present in Serbia (such as Metro, Vero, Merkator, Idea, Tuš) have been already operating standard food safety management systems, so the expectations towards the Serbian food suppliers were equally high. The controlling process of the implementation of these standards and criterions were carried out in forms of customer audits, using a preconceived list of interview questions. Any control procedure involved checking of the required documentation, records and warrants. Later, the multinational supermarket and retail chains were asked to posess a certificate given by an independent commitee for HACCP food safety system. During this period, the Ministry of Agriculture, Forestry and Water Management (MAFWM) were providing financial support for food producing plants to introduce the HACCP food safety system and ISO 9001 quality management system.

The reason why the Ministry has chosen the HACCP certification - as a way of settlement - when calling for application and announcing the tenders was the lack of a sufficient number of HACCP experts. Interestingly enough, the Metro retail chain has not been utterly satisfied with the HACCP and ISO 9001 certificates, instead it has required

the operation of stricter management systems. It expects from the producers, suppliers, and logistic companies to follow the standards and criterions of the so-called GFSI (Global Food Safety Iniative).

Based on the above mentioned facts, it can be clearly seen that the system of traceability has not been fully implemented in the Serbian food production system yet. On the one hand, there is a lack of supervision by the food safety authorities. On the other hand, keeping proper documentation and implementing traceability systems are not binding in agriculture.

### Main objectives and hypotheses of the dissertation

The present work aims to examine the implementation of traceability – from the point of view of the 'farm-to-table' approach - in food safety in the Serbian food system. Though, I briefly describe the most common traceability techniques and methods I will not deal with them in deatils throughout my work.

Furthermore, I analyse the consumers' expectations, purchase behaviour and awarenes of food safety along wit those food safety and quality standards that could provide help in ensuring traceability in certain sectors. The primary aim of my work is to make a proposal on how to reach a transparent and more effective traceability system in the Serbian food chain by highlighting the occurrent shortcomings and legal gaps.

The thesis revolves around the following issues:

- In the frame of secondary research, I analyse the most important laws and regulations concerning food safety both in the European Union, and in Serbia and also provide an insight into the entitlements, duties and responsibilities of food safety authorities. More specifically, I research the methodology of risk analysis and risk communication in case of the Serbian Food Safety Authority.
- I briefly introduce the available and applicable traceability techniques, methods and systems in food industry.
- During the secondary research, I examine some specific standards of quality supervision and food safety in agriculture and food industry that emphasize the importance of traceability through all stages of production, processing and distribution.

• I analyse and compare all the food safety and traceability laws and regulations currently being in force in Serbia.

Additionally, in the frame of primary research special emphasis was placed on agriculture and food processing industry:

- Questionnaires were conducted to estimate the rate of food safety standard fulfillment, traceability trancparency and quality control in case of certain factories and plants.
- The questionnaire data provided help for getting an overview of the perceptions, habits and needs of consumers concerning the issues of food safety and traceability of products.
- Beside the theoretical research, the present thesis aims to higlight some developmental opportunities in the Serbian food chain; some ideas that will help to materialize the 'farm-to-table' approach in the Serbian context.

# **Basic hypotheses:**

- 1. In my opinion, the food safety authorites in Serbia are not entitled to monitor the whole food chain system.
- 2. Based on my assumption, the risk communication and the risk management of the authorities have not been transparent and successful enough.
- 3. In general, traceability in the Serbian food chain system through all stages (from farm to table) is not guaranteed.
- 4. However, I assume that those companies and plants that work by the standards of some established food safety systems are able to realise the traceability of their products.
- **5.** I also take it that consumer habits and behaviour in Serbia do not support the trade of safe and traceable food products.

## **Research methodology**

I had first hand experience about the importance of food safety and traceability when growing fruit and seasoning paprika in a family business and having an own small seasoning paprika processing plant in the 90s. I have roughly ten years of professional experience as a quality control-and food safety consultant. During this period I have helped the introduction to the system of HACCP, ISO 9001, ISO 22000 and EurepGAP/GlobalG.A.P in case of numerous businesses. During my consultency work I was involved in the controls implemented by licensing authorites, so I gained experience in the field of supervision by the Food Safety Aiuthority. Furthermore, from 2007 I have been working as a quality control and food safety auditor and lead auditor where my main responsibilites include the control and supervision of the required documentation of businesses on quality management and food safety and the implementation of food safety standards in practice.

# Research phases:

In the very first phase of the research I carry out a thorough analysis of the literary background as suggested by Majoros (2004) in his book, The Bases of Research Methodology. As part of my secondary research, I deal with the relevant literature published in Hungarian, English and Serbian. More precisely, I overview the best part of the existing literature on food safety and traceability regulations being in force in agriculture and food industry, and also examine the issues of quality control and - management. Furthermore, I provide a brief review of the most common methods in tracking food, and I also explore the food policy of the EU in details. I put special emphasis on the relevant Serbian literature (as suggested by Somogyi and contributors (2002)). Further, in my secondary reserch I analyze the EU's food safety policy and introduce it's most important offices.

Following this, I describe the Serbian legislations concerning food safety and traceability. When looking up the operative food safety laws and regulations in Serbia I used ParagrafLex softver, a so-called law dictionary. ParagrafLex has two main advantages; one is that it contains the modifications of the laws in a transparent way, and the other is that it makes searching in the database possible by using key words. The Serbian food safety legal framework in my paper is explored and presented by paying close attention to the guidelines and specifications of the EU. Besides the introduction of

the legal framework, I provide an insight into the structure, entitlements and duties of the Food Safety Authority in Serbia. Part of the secondary research concentrates on regulations concerning the issue of risk communication.

In the phase of the primary research I describe the basic requirements and implementation possibilities of traceability in the Serbian food system

Primary research was carried out in the following fields:

### Agriculture

Questionnaire data was collected about the registered farms involved in the primary production. 950 respondents filled out the questionnaires that were made with the help of Google questionnaire editor. 230 questionnaires were valid for futher analysis, the data was automatically uploaded into Google Docs scales. The information and data was saved in Microsoft Excell format. Furthermore, additional qualitative data was gained by conducting in-depth interviews (based on a set of predefined questions) with 20 participants involved in the process of primary food production. The provided data was further analysed in Microsoft Excell format.

### Food processing industry

In the frame of primary research, 300 Google blanks were sent out to food processing operators, however only 183 questionnaires were valid for futher analysis. The data was automatically uploaded into Google Docs scales. The findings were represented in the format of Microsoft Excell diagrams.

To gain some further information, I also conducted 30 in-depth interviews (based on a set of predifined questions) with food processing enterprise representatives. During the interviews, I was taking notes about the respondents' answers and the data was further analysed in Microsoft Excell.

#### Consumers

As a part of my primary research, I conducted questionnaires (Google blanks) to 575 consumers. The gained data was uploaded into Microsoft docs and analysed further with Microsoft Excell.

## The main findings of the research

## The main findings of the law analysis

From the late 20th century frequent food safety incidents and scandals have brought to the surface the growing need for revision and modification of the existing food safety laws and regulations, as this is the most important condition of safe food production.

In order to win back customer trust the European Comission made the EU's General Food Law which entered into force in 2002 and makes traceability (farm-to-table) compulsory for all food and feed businesses. It requires that all food and feed operators implement special traceability systems. The Animal Health Law (2005) was the first regulation in Serbia that made the application of the HACCP food safety system compulsory for the protein processing plants (forage-, -meat, and -dairy industry), as well as the term 'traceability' as a risk management tool was mentioned here for the first time.

The Animal Health Law was followed by the Law of Food Safety, where traceability is mentioned as a prerequisite in safe food processing and production. Along with the above mentioned laws, the relevant guidelines and regulations came out, as well as the list of requirements for the registry of plant-based food products were published.

Two principal organisations are involved in food safety in Serbia: The Ministry of Agriculture, Forestry and Water Management and the Ministry of Health including the Secretariat for Health in the autonomous Province of Vojvodina. However, it could be stated that there is a lack of a standard and proper food safety control due to the different separate authorities working on their own. As a result of a lack of a properly integrated food safety authority there are segments in the food chain where there is no monitoring at all.

Based on the above mentioned facts, I believe the supervision of the food chain and food system in Serbia is quite complex and diffuse. Though the risk communication of the government is legally regulated, it is not only rarely applied but quite unsuccessful.

### The main findings of the primary research

## Agriculture

According to the legislations in Serbia, farm registration is not binding for the agricultural workers. Registry is carrried out in the local exchequer. Responding farmers claimed that in the previous year they mostly asked for consultancy in two fields; the annual farm registration or tenders and application callings. Even though, the best part of them lacks any professional knowledge on the subject of pesticides and their proper use, 22% of them did not take part in any professional trainings during the previous year.

Figure 1 represents data about the proportion of notes and records on food safety and tracebility in case of farmers in the process of production.



Figure 1. The proportion of notes and records among farmers (Source: own editing)

It's worth mentioning that only 14,35 % (33) of the farmers have some kind of 'keeping track' records about the production phase.

The data analysis of the in-depth interviews reveals that only 10% of the respondents are familiar with the laws and legislations concerning food production. In addition, only 15% of the participants (3 people) are familiar with the list of chemicals used for weed control in the current year. This leads me to say that without this proper knowledge safe food production could not be ensured at all.

Farm shops may sell pesticides that contain materials or ingredients that are not authorised in the current year or are not allowed to be used in case of certain crops. When selling their farm produce and crops producers are usually asked to show the relevant documents on farm registration, spraying logs are only needed if crops are for export.

Interestingly enough, only 60% of the respondent producers (12 people) get any proof of the purchase. However, 7 out of these 12 claim that the amount of the purchased crops on these documents is usually bigger, so the purchase data is false. As a result of false purchase data, or the fact that the sellers on the markets are not obliged to give receipt or any kind of documentation on traceability leads to the present situation in the Serbian agriculture, namely that most of the raw materials involved in food production cannot be tracked.

# Food processing plants

Figure 2 shows the existance and the implementation status of HACCP food safety system:



Figure 2. The frequency of HACCP food safety system (Source: Own editing)

Despite the fact that the use of HACCP is legally regulated, 3 plants claimed that they had not used it at all.

Figure 3 provides information about the implemented food safety and traceability systems used by the researched enterprises.



Figure 3. Food safety management systems used by the researched enterprises (Source: Own editing)

It could be stated that food safety -and quality management standards are quite widely used in the Serbian food production system. Enterprises under scrutiny posess the required documents that provide a good basis for the introduction of a transparent traceability system.

Figure 4 illustrates the percentage of the verification of traceability in case of independent parties.



Figure 4. The control of traceability by idependent parties (Source: Own editing)

The control of safety of food, feed and traceability is very rare on behalf of the Food Safety Authority. However, the study also revealed that when food producing and processing plants applied self-checking to prove traceability, mock product recalls were rarely successful (only in case of 48 businesses, which means 26% of the total). It is worth mentioning, that using mock recall is one of the most valuable practice in measuring quality in food production and processing. Mock recalls are routine exercises conducted by producers, processors, distributors and other various trading partners in the supply chain to assess their recall procedures and responsiveness. It should be emphasized that recalls keep businesses prepared for an emergency event.

Based on the information obtained from the responding food processing plant leaders during the in-depth interviews, it is revealed that 70% of the businesses involved consultants when a traceability system was initiated. As there is a lack of appropriate professional cadre for the operation of HACCP food safety system and traceability systems in food industry firms the role and contribution of food safety consultants is significant when it comes to the operation of food safety systems and quality development supervision in companies.

47% of the enterprises participating in the study involved a third, independent party when certifying its HACCP system.

None the less that certificates lack accreditation, respondents believe that it's still worth involving a HACCP auditor on yeary bases. The HACCP Auditor analyzes all elements of the system and reports on how well it adheres to the criteria for management and control of process safety. Thus the contribution of independent third party food audits is crucial in assuring food safety.

The business involved in the study started to use HACCP food safety system and ISO 9001 quality management system in the period of 2006-2010 when the Ministry of Agriculture, Forestry and Water Management were providing financial support for food producing plants for the initiation.

When having a look at the traceability notes and records, it turned out that documents appear in three different forms, namely in paper form (in case of 53% of plants), in mixed (both paper and electronic) form (40%) and electronic form (7%).

In my opinion, only in the case of the last two documentation forms could the effectiveness of traceability be guaranteed.

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Out of all the respondents only one claimed that the authorities carried out an allround control. In case of the others, the Food Safety Authority checked only the traceability and product recall documentation.

8 representatives of the interviewed HACCPP certified plants stated that they agree if the the results on the system's adequacy and deficiancies gained by a HACCP auditor are made official and are available to the Food Safety Authority for further control.

#### Consumers

Based on the information obtained from the consumers, it turned out that 54 % of them are not satisfied at all, and 41% of them are just partiatially satisfied with the effectiveness of risk communication of Food Safety Authority. Only the remaining 5 % thinks that risk communication is effective, as it intends to share knowledge and understanding about potential risk in a manner that helps consumers make well-informed decisions.

The great majority of consumers are not only dissatisfied with risk communication but 62 % of them are not even familiar with the relevant authority being in charge of a possible food safety incident or problem.

This may lead us to conclude that the risk communication of authorities is not at all effective, they cannot communicate food problems and risks successfully.

The next figure, Figure 5 contains information regarding consumer perceptions about the issue of traceability, namely I try to find the answer to the question of whether consumers consider it possible to track any food, feed that will be used for consumption through all stages of production, processing and distribution in Serbia.



Figure 5. Consumer views on traceability of food products (Source: Own editing)

I believe that the mistrust in traceability is partly due to the markets where illegally imported products (mainly vegetables and second hand goods) can be bought from individuals lacking the proper permissions and documentation.

Figure 6 illustrates the customer habits in Serbia, namely it reaveals where customers buy certain product categories. The questionnaire provided the option of "other source" answer referring to unauthorised purchase sources.



Figure 6. Consumer purchase habits (Source: Own editing)

Based on the analysis, it could be stated that consumer behaviour and purchase habits do not support safe food production and processing In Serbia.

## **Reflections on premises and hypotheses testing**

After the analyses of the relevant literature, the food safety laws and legislations and further examination of the quantitative questionnaire -and qualitaive in-depth interview data I reflect on my previously listed 5 basic premises in the following way:

1. In my opinion, the food safety authorites in Serbia are not entitled to monitor the whole food chain system.

Plant growers are not obliged to keep notes and records about the agricultural works and processes. In addition, Agricultural and Plant Health Authorities are not entitled to ask for any kind of documentation from the farmers. Unfortunately, this may be a hazard for food safety because the hired state-owned lands and the content of soil cannot be tracked.

The situation is getting worse, if we take into consideration that farm shops may sell unauthorised pesticids and fertilizers, or that it is not binding for farmers to posess any kind of professional knowledge about pest control. This directly leads to uncussessful traceability results in crop and plant production and processing. In case of food products coming from multiple sources (such as foods in restaurants, bakeries, frozen processed foods) the traceability control is carried out by two authorities. The Animal Health Authority controls the aninmal-based ingredients, while the plant-based ingredients are controlled by the Plant Health Authority. In this way, there is no opportunity for comprehensive traceability..

It is not at all compulsory for small retail shops which trade animal-based food products to implement the HACCP food safety system in 12 steps, all they need to have are good manufacturing practices (GMP), good hygiene practices (GHP) and a food safety plan. Consequently, in this context no HACCP team leader or expert is needed, noone is in charge of product recall.

As a conclusion, it can be stated that traceability system in Serbia is quite unsuccessful thanks to the lack of proper control of food and feed by the responsible authorities, and the poor legislation system. 2. Based on my assumption, the risk communication and the risk management of the authorities have not been transparent and successful enough.

Though the Serbian food safety legal framework disposed it as necessary, there has not been a special Commission for Food Safety and Risk Management established yet. This means, that in case of a potential food risk situation risk communication would not be effective.

This is confirmed by negative consumer views claiming that food safety authorities do not share knowledge and understanding about food risks and incidents in a manner that helps consumers make well-informed decisions.

3. In general, traceability in the Serbian food chain system through all stages (from farm to table) is not guaranteed.

The analysis of questionnaire data reveals that farmers do not keep documentation relating to pesticides and fertilizers used in the process of crop growing. However, when coming to sale customer and consumer pressures make farmers fill in spraying logs (retrospectively). The operative laws and regulations do not require the ensurance of forage traceability in small, domestic livestock farming. Even though, the tracebility is not ensured, the animals could be freely sold without any veterinary approval to cutting plants.

In addition, the guidlines for the operation of GMP, GHP and HACCP system do not contain any reference to the traceability of food packaging materials and wrappers.

When a plant is subject to inspection, the relevant food industry authority would control the required documentation for traceability plan, corrective action plan and prevention plan. A complex (farm-to-table) traceability control procedure relating to all raw materials, ingredients and food packaging materials does not exist in the Serbian context. In light of this, it cannot be proved that all the participants of the feed can ensure traceability; it cannot be claimed that they are able to track any food, feed, food-producing animal or substance that will be used for consumption, through all stages of production, processing and distribution.

4. However, I assume that those companies and plants that work by the standards of some established food safety systems are able to realise the traceability of their products.

Those companies that follow the standards of ISO 22000, FSSC 22000, IFS, BRC management systems, with HACCP food safety system are more likely to achieve successful traceability. Similarly, using audits are also a vital part of the management system approach as they enable the company to check how far their achievements meet their objectives and show conformity to the standard. Furthermore, product recalls are highly important; they confirm that a company can trace products throughout the supply chain and determine whether or not their communication plan is efficient. Ultimately, recalls are about mitigating risk and measuring the ability to react to an emergency event with as much precision as possible. Successful product reacalls mean that traceability is working.

5. I also take it that consumer habits and behaviour in Serbia do not support the trade of safe and traceable food products.

As markets are not controlled by the Food Safety Authority, large numbers of illegal and unauthorised food products are being circulated in the grey economy. This may cause serious health risks and food safety threats because most of these traded food products derive either from illegal butcherings, or smuggling from abroad, so in case of a food incident and emergency traceability is out of question. In the majority of bakeries, snack bars and cook shops receipts are not given to customers which may lead us to the conclusion that keeping track of the the raw materials in final product would be simply impossible.

The above mentioned facts suggest that consumer behaviour and awarness of food safety do not provide a bases for safe food consumption habits in Serbia.

## The new, scientifi findings of the research

- There is a need for a Central Food Safety Office that would coordinate the work and supervision of the separate food safey authorities and would include the Authorities of Customs, Tax, Environment and Safety into the process of food safety and quality development.
- The key of effective traceability lays in the ability of a strong cooparation with other relevant authorities on daily bases, as well as on the ability to control all the stages of production, processing and distribution.
- 3. There is a growing need for special questionnaires used for the purpose of self-checking in every sector in agriculture containing information on repository technology, or steps of processing. This self-checking procedure may provide help for the farmers and crop growers to estimate their preparedness and awareness relating to food safety and traceability. The effective traceability system of plants and food businesses could ensure product traceability in all stages of production, processing and distribution. In order to reach this, the duties and responsibilities of food and feed businesses operators should be made very clear.
- 4. It is time to realise that in the field of food safety effective risk assessment, risk management and risk communication could be only done by a group of well-trained and authorised experts whose primary task would be the coordination and harmonisation of the work of the relevant ministries when coming to incidents and problems in food safety. Successful and effective risk communication might even change consumer habits and behaviour in the long run as well.

Even though the plants and businesses operating food safety systems are mostly able to ensure traceability, there would be a need for clear and unambiguous traceability guidlines and criterions in all sectors. Similarly, the entitlements and duties of the Food Safety Authority should be legally regulated.

5. HACCP Certification could be made more transparent if HACCP certificates were given by professional certified HACCP auditors who understand the standards and

principles of auditing a HACCP-based (or process-safety) system. Similarly, in each case the HACCP certificates should be validated by the Ministry of Agriculture. In addition, if the reports of the HACCP auditors were taken into considertion, the process of supervision by the Food Safety Authority could be more effective.

6. The central registry (Centralni registar) on food supply chain should be made up-todate in electronic form. The database would for instance contain information on repository technology of products of the licensed traditional small scale producers, or on the hotel or catering trades that provide seasonal food sale services. Without up-to-date data bases food production and distribution cannot be made

transparent for the authorities. Full traceability could be only ensured by being able to keep track of any food through all stages of production, processing and distribution, in other words, from farm to table.

## The possible practical utilization of the results

The results of my research could be utilized in several ways: 1.Joint control should be carried out involving the Customs-, Tax-, Financial Supervision-, Market Surveillance-, Animal Health, and Agricultural Authorities.

2. HACCP certificates should be given to food producers by professional certified HACCP auditors who understand the standards and principles of auditing a HACCP-based (or process-safety) system, which could provide help to the Food Safety Authority in futher control. Similarly, the HACCP certificates should be validated by the Ministry of Agriculture.

3. Wholesale food producers and retail trade distributions should be controlled by specific food safety authorites with properly determined scope of authority.

4. Only those registered food producers should receive agricultural subsidy that operate traecability system (being able to keep track of the used pesticides and fertilizers) and regularly keep food safety records.

# Literature

- Szeitzné Szabó M.: 2007. Az élelmiszer-biztonság helyzete és jogi szabályozása az Európai Unióban. [In: Balla Cs.–Siró I. (szerk.) Élelmiszer-biztonság és minőség 1. Alapismeretek] Mezőgazda Kiadó, Budapest. 87-98
- Stojšić M.- Nastasijević I.-Vulović D: 2004. Zanatska prerada mesa, bolesti zoonoze i sistem kontrole bezbednosti hrane, SD Publik, Beograd
- 3. Állategészségügyi Törvény- Zakon o veterinarstvu "Sl. Glasnik RS", br. 91/2005,30/2010, 93/2012)
- Élelmiszer-biztonsági Törvény Zakon o bezbednosti hrane ("Sl. glasnik RS", br. 41/2009)
- 5. Az Európai Parlament és a Tanács 178/2002/EK Rendelete (2002. január 28.) az élelmiszerjog általános elveiről és követelményeiről, az Európai Élelmiszerbiztonsági Hatóság létrehozásáról és az élelmiszerbiztonságra vonatkozó eljárások megállapításáról.

## List of publication





Registry number: Subject: DEENK/206/2015.PL Ph.D. List of Publications

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#### List of publications related to the dissertation

#### Foreign language international book(s) (2)

- Dovijarov, D., Csanádi, J., Győri, Z., Hodúr, C., Kovács Sárkány, H., Kovács, V., Lengyel, L.: Milk business od njive do krava(te). European-cert, Szabadka, 99 p., 2014. ISBN: 9788689785005
- Kovács, V., Huszka, T., Kovács Sárkány, H.: GLOBALG.A.P. ver.4.0.: Priručnik za poizvođače voća i povrća = Kézikönyv a zöldség- és gyümölcstermesztők részére. Udruženje Baštovana Senta, Senta, 103 p., 2013. ISBN: 9788689819007

#### Hungarian scientific article(s) in Hungarian journal(s) (4)

- Kovács V., Kovács Sárkány H.: Eredetvédelem és nyomon követhetőség a vajdasági agráriumban. *Economica.* 8 (3), 186-191, 2015. ISSN: 1585-6216.
- Kovács V., Kovács Sárkány H., Lálity Z.: A földieper termesztése és nyomon követhetősége Vajdaságban.
   Economica. 8 (3), 192-198, 2015. ISSN: 1585-6216.
- Kovács Sárkány H., Kovács V.: Az élelmiszerek nyomon-követhetősége és a fogyasztókkal kapcsolatos aspektusai a Vajdaságban. *Economica. 8* (3), 179-185, 2015. ISSN: 1585-6216.
- Kovács V., Kovács Sárkány H.: Nyomon-követhetőség a vajdasági fűszerpaprika termesztésben és előállításban. *Economica. 7* (3), 208-214, 2014. ISSN: 1585-6216.

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Hungarian conference proceeding(s) (9)

 Kovács Sárkány H., Kovács V.: Az IFS szabványok (international featured standards) alkalmazásának lehetőségei és jogszabályi kapcsolódási pontjai a szerbiai élelmiszer feldolgozó iparban.

In: Tudástérkép : konferenciakötet : Vajdasági Magyar Tudóstalálkozó 2014 : [Elektronikus dokumemtum]. Szerk.: Berényi János, Vajdasági Magyar Akadémiai Tanács, Újvidék, 216-221, 2014. ISBN: 9788689095067

8. Kovács V.: Beszállítói követelmények a szerbiai élelmiszerláncban.

In: "Szervezetek és vállalatok aktuális kérdései : IX. KHEOPS Nemzetközi Tudományos Konferencia : fiatal kutatók tudományos fóruma : előadáskötet : Mór, 2014. auguasztus 26. [Elektronikus dokumentum]. Szerk.: Svéhlik Csaba, Kheops Automobil-Kut. Int., Mór, 17-23, 2014. ISBN: 9789638977922

9. Kovács V.: Beszállítói kritériumok friss zöldség gyümölcs előállítóknak.

In: A magyar agrár felsőoktatás aktuális kérdései PhD-s szemmel : I. workshop : 2014. február 21., Pannon Egyetem Georgikon Kar, Keszthely. Szerk.: Gór Arnold, Fitos Gábor, Doktoranduszok Országos Szövetsége-Agrártudományi Osztály, Keszthely, 70-75, 2014. ISBN: 9789638956033

 Kovács V., Kovács Sárkány H.: Friss zöldség, gyümölcs beszállítói kritériumok az élelmiszer láncban a Vajdaságban.

In: Régiók fejlesztése : "Régiók fejlesztése" Támop-4.2.1B-10/2/KONYV-2010-0002 Projekt kutatászáró konferencia Pécs, 2013. Május 23-24. Szerk.: Buday-Sántha Attila, Danka Sándor, Komlósi Éva, Pécsi Tudományegyetem Közgazdaságtudományi Kar, Pécs, 398-405, 2013. ISBN: 9789636425296

11. Kovács V., Kovács Sárkány H.: A vajdasági tejtermelő gazdaságok és tejfeldolgozó üzemek élelmiszerbiztonsági fejlesztési lehetőségei.

In: A hely szelleme - a területi fejlesztések lokális dimenziói : Fiatal Regionalisták VIII. Konferenciáján elhangzott előadások : Győr. 2013. június 19-22. Szerk.: Rechnitzer János, Somlyódyné Pfeil Edit, Kovács Gábor, Széchenyi István Egyetem, Győr, 336-342, 2013. ISBN: 9786155391101

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12. Kovács V., Kovács Sárkány H.: Élelmiszerbiztonság és nyomonkövethetőség a takarmánygyártásban.

In: "Tudományos próbapálya" : PEME VI. Ph.D. Szerk.: Koncz István, Nagy Edit, Professzorok az Európai Magyarországért Egyesület, Budapest, 604-609, 2013. ISBN: 9799638843388

13. Kovács V.: Szabványok új kihívásai az élelmiszeriparban.

In: Fiatal kutatók az egészséges élelmiszerért : tudományos ülés : Debrecen, 2013. február
19. Szerk.: Bacskainé Bódi Éva, Fekete István, Kovács Béla, Debreceni Egyetem, Debrecen, 72-77, 2013. ISBN: 9789634736011

14. **Kovács V.**, Kovács Sárkány H.: Takarmányadalékok nyomon követhetősége és szabványosítása.

In: Tudományos diszkurzusok : konferenciakötet : Vajdasági Magyar Tudóstalálkozó 2013 : Szabadka, 2013. április 13. Szerk.: Berényi János, Vajdasági Magyar Akadémiai Tanács, Újvidék, 329-336, 2013. ISBN: 9788689095043

15. **Kovács V.**, Kovács Sárkány H.: Nyomon követhetőség biztosítása a szerbiai élelmiszerláncban a GlobalGAP tükrében.

In: Nemzedékek együttműködése a tudományban : PEME IV. nemzetközi tudományos Ph.D. konferencia előadásai (Budapest, 2012. november 15.) [Elektronikus dokumentum]. Szerk.: Koncz István, Nagy Edit, Professzorok az Európai Magyarországért Egyesület, Budapest, 41-46, 2012. ISBN: 9789638843371

#### Foreign language conference proceeding(s) (1)

 Kovács, V., Kovac-Sarkanj, H., Raketic, B.: Possible answers to the new challenges of the agricultural production toward rural development and agro-economic efficiency.
 In: Book of proceedings : Third International Scientific Symposium "Agrosym 2012", Jahorina, November 15-17, 2012 [Elektronikus dokumentum]. Ed.: by Dušan Kovačević, Branislav Raketić, Poljoprivredni fakultet, Istočno Sarajevo, 746-751, 2012. ISBN: 9789995575106

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#### List of other publications

#### Hungarian book(s) (5)

- Kovács Sárkány, H., Kovács, V.: Sajtok és túróféleségek készítése házilag. Háló Vajdasági Fejlesztési Alapítvány, Szabadka, 32, 32 p., 2014. ISBN: 9788689917000
- Kovács Sárkány, H., Kovács, V.: Gyümölcsfeldolgozás, befőttek és lekvárfélék készítése házilag. Háló Vajdasági Fejlesztési Alapítvány, Szabadka, 32, 32 p., 2014. ISBN: 9788689917017
- Kovács Sárkány, H., Kovács, V.: Száraztészta készítése házilag. Háló Vajdasági Fejlesztési Alapítvány, Szabadka, 32, 32 p., 2014. ISBN: 9788659917055
- Kovács Sárkány, H., Kovács, V.: Húsfeldolgozás házilag. Háló Vajdasági Fejlesztési Alapítvány, Szabadka, 32, 32 p., 2014. ISBN: 9788689917024
- Kovács Sárkány, H., Kovács, V.: Savanyúság készítése házilag. Háló Vajdasági Fejlesztési Alapítvány, Szabadka, 32, 32 p., 2014. ISBN: 9788689917048

#### Foreign language international book(s) (1)

22. Kovač Šarkanj, H., **Kovač, V.**, Bataković, R.M.: Priručnik za primjenu HACCP sistema u restoranima. NVO Agro grupA, Podgorica, 38 p., 2013. ISBN: 9789940907945

Hungarian scientific article(s) in Hungarian journal(s) (4)

- 23. Kovács Sárkány H., **Kovács V.**: Őstermelő vagy élelmiszer-feldolgozó?: Vajdasági helyzetkép. *Economica*. 7 (3), 202-207, 2014. ISSN: 1585-6216.
- Kovács Sárkány, H., Kovács, V.: A fűszerpaprika mikrobiológiai paramétereinek jogszabályvizsgálata, valamint szerbiai gyakorlati alkalmazása =Legal analysis for the microbiological parameters of paprika, and their practical application in Serbia. *Élelmvizsg. Közl. 60* (4), 391-399, 2014. ISSN: 0422-9576.

Address: 1 Egyetem tér, Debrecen 4032, Hungary Postal address: Pf. 39. Debrecen 4010, Hungary Tel.: +36 52 410 443 Fax: +36 52 512 900/63847 E-mail: <u>publikaciok@lib.unideb.hu</u>, ¤ Web: <u>www.lib.unideb.hu</u>





- Kovács Sárkány H., Kovács V., Győri Z.: A szerbiai és vajdasági védjegyek, valamint a Hungaricum védjegy megítélése. *Minős. Megbízh.* 47 (3), 165-170, 2014. ISSN: 0580-4485.
- Kovács Sárkány H., Kovács V.: A siker kulcsa a dolgozók felkészültsége. Hum. Innov. Szle. 3 (1-2), 89-96, 2012. ISSN: 2062-0292.

#### Hungarian conference proceeding(s) (5)

- Kovács Sárkány H., Kovács V., Marosi T.: "Enni vagy nem enni": Élelmiszer-hamisítás, avagy a (szerbiai) élelmiszer-biztonság kihívásai és lehetőségei.
   In: Kihívások és lehetőségek : válogatott társadalomtudományi tanulmányok. Szerk.: Novák Anikó ls Rózsa Rita, Vajdasági Magyar Doktoranduszok és Kutatók Szervezete, Szabadka, 147-156, 2014. ISBN: 9788686935010
- Kovács Sárkány H., Kovács V.: A szerbiai élelmiszer-feldolgozó ipar élelmiszer-biztonsággal kapcsolatos feltételrendszere.

In: Tudományos diskurzusok : konferenciakötet : Vajdasági Magyar Tudóstalálkozó 2013, Szabadka, 2013. április 13. Szerk.: Berényi János, A Vajdasági Magyar Akadémiai Tanács, Újvidék, 320-328, 2013. ISBN: 9788689095043

- Kovács Sárkány H., Kovács V.: Élelmiszereink bölcsője: A vidék.
   In: XVIII. Nemzetközi Tehetséggondozási Környezetvédelmi és Vidékfejlesztési -Diákkonferencia : Szolnok, 2012. szeptember 28-29. Szerk.: szerk. Szabó Attila, Alumni K., [Szolnok], 35-36, 2012. ISBN: 9789638933966
- 30. Kovács Sárkány H., Kovács V.: A szerbiai élelmiszeripari cégek minőségügyi és élelmiszerbiztonsági felkészültsége az EU küszöbén.
  In: Nemzedékek együttműködése a tudományban : PEME IV. Ph.D. Szerk.: Koncz István, Nagy Edit, Professzorok az Európai Magyarországért Egyesület, Budapest, 33-40, 2012. ISBN: 9789638843371
- 31. Kovač Šarkanj, H., Kovač, V.: Primenjivanje standarda i propisa u cilju evropske integracije. In: Agroprivreda Skbije u pretpristupnom periodu : tematski zbornik = Agrarian Economy of Serbia in the Pre-accession Period : themathic proceedings, Ed.: editors Branislav Vlahović, Danilo Tomić, Aleksej Semenovic Ovcinnikov, "DAES" Društvo agrarnih ekonomista Srbije, Beograd, 137-146, 2012. ISBN: 9788686087348

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Foreign language conference proceeding(s) (2)

32. Kovács Sárkány, H., **Kovács, V.**: Analysis of Food Safety Management Systems in Serbian Food Processing Industry.

In: Food Science Conference 2013 : with research for the success of Darányi Program : 7-8th November, 2013 : Budapest, Hungary. Corvinus University of Budapest Faculty of Food Science, Budapest, 392-395, 2013. ISBN: 9789635035502

 Kovács Sárkány, H., Kovács, V.: Food safety and quality management systems applied in Serbian and Hungarian food chain.

In: 7. International Quality Conference : may 24. 2013. Ed.: Slavko Arsovski, Miodrag Lazic, Miladin Stefanovic, University of Kragujevac-Faculty of Engineering, Kragujevac, 309-314, 2013. ISBN: 9788686663948

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