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# Open Food Innovation University (OFINU)

# DESCRIPTION OF STUDY MODULE
# "FOOD SAFETY MANAGEMENT"

**2024**

## Summary

The study course is elaborated within the project “Open Food Innovation University" (OFINU), being in implementation with support of the European Union Erasmus+ Programme.

**Overall objective** of the project - to modernise food innovation and technology related higher education in Uzbekistan and Tajikistan, thereby increasing the quality and ensuring relevance of the higher education to the needs of the socio-economic growth of the countries concerned and especially of their regions.

**Full partners:**

- Lead partner: Latvia University of Life Sciences and Technologies
- Uzbekistan: Samarkand Agro-innovations and Research University, Andijan Institute of Agriculture and Agro-technologies
- Tajikistan: Technological University of Tajikistan, Kulob Institute of Technology and Innovation Management, Isfara Branch of the Technological University of Tajikistan
- Slovakia: Slovak University of Agriculture in Nitra

**Associated partners in Uzbekistan:**

- A group of companies "AGROMIR"
- "Navigul" MCHJ QK
- “Samarqand don mahsulotlari” JC (Samarkand grain products)

**Associated partners in Tajikistan:**

- CJSC “Combinati Shiri Dushanbe”
- LTD "Orion Rustam"
- Association of Entrepreneurs of Khatlon

**The project implementation period:** 01/02/2024 - 31/01/2027.

*Funded by the European Union. Views and opinions expressed are however those of the authors only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency. Neither the European Union nor the granting authority can be held responsible for them.*

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Shakhista Ishniyazova - food safety, standardization and certification of livestock and crop products.

**P3 AIAA. Andijan Institute of Agriculture and Agro-technologies**

**P4 TUT. Technological University of Tajikistan**

Gafurjon Hakimov - Food Safety Management.

Shuhratjon Nazarov - Food Safety Management.

**P5 KITIM. Kulob Institute of Technology and Innovation Management**

Bobokhon Qurbonzoda - food safety.

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**P6 BTUTI. Branch of the Technological University of Tajikistan in the city of Isfara**

Sirojiddin Boboev - food safety.

**P7 SUA. Slovak University of Agriculture in Nitra**

Jozef Čapla - Food safety management system.

Simona Kunová - food hygiene and safety.

Peter Zajác - HACCP system, food safety management system.

**Group of companies "AGROMIR" (UZ)**

Irina Krasilnikova - Quality management.

# INTRODUCTION

**Study module "Food Safety Management"** One of the most important assets of a food company is the trust of its customers and consumers. As such, over and above being a legal obligation, food safety constitutes one of the most fundamental and vital aspects of any food operation. It is the backbone of consumer trust.

However, ensuring food safety in today's world has become a daunting task as, on the one hand, the food industry is confronted with a very broad range of chemical, microbiological and physical hazards that may find their way into the food supply at any stage of the food chain. On the other hand, measures taken to protect consumers are often intertwined with other considerations. In addition to food safety, a successful food business must also meet an array of other expectations. These vary with lifestyle, values, culture, and level of education and perception of a population. Today, a wide range of measures are applied in food industries to assure food safety. These measures can take place at different levels including: product development and research, supplier management (eg, auditing suppliers, developing specifications), management of people (training, job description, performance evaluation, and career path), production, consumer and customer contacts, marketing and distribution (eg, auditing transporters and retailers), incident and crisis management, and management review.

**Aim and objectives** of the study subject is to acquaint students with food safety systems throughout the food chain, to explain the prerequisite of health and consumer protection and to acquaint students with preventive measures against chemical and biological risks in food production.

**Learning outcomes**

- Knowledge: The student will gain knowledge of new food safety systems applied throughout the food chain, understand the practical application of food safety systems at the level of the food company.
- Skills: The student acquires and applies knowledge of food safety in risk prevention, acquires knowledge and analyzes the consequences of food crises and their impacts.
- Competences: The student is able to demonstrate critical, independent and analytical thinking and has extensive expertise in the field of food safety management systems and their use in practice. She/he is able to identify potentially dangerous products, food or suspicious producers.

## Study Plan for module "Food Safety Management" in Uzbekistan

| Themes | **Number of hours** SK/UZB/TJ | | | |
|---|---|---|---|---|
| | Total | Lectures | Practical works | Independent work of the student |
| **1. Introduction to food safety** | 14 | 4 | 0 | 10 |
| **2. Rapid Alert System for Food and Feed (RASFF)** | 18 | 4 | 2 | 12 |
| **3. Biological safety** | 20 | 4 | 4 | 12 |
| **4. Food Hygiene and safety** | 16 | 2 | 4 | 10 |
| **5. Food-borne diseases (Zoonoses)** | 12 | 2 | 2 | 8 |
| **6. Food fraud and food authenticity** | 10 | 2 | 2 | 6 |
| **7. Chemical safety** | 12 | 4 | 0 | 8 |
| **8. Food labelling** | 10 | 2 | 2 | 6 |
| **9. Novel food** | 10 | 2 | 2 | 6 |
| **10. Sanitation in food industry** | 12 | 4 | 0 | 8 |
| **11. Disinfection methods** | 16 | 4 | 2 | 10 |
| **12. Sanitation program** | 16 | 2 | 4 | 10 |
| **13. Microbial biofilms in food industry** | 10 | 2 | 0 | 8 |
| **14. Genetically modified foods** | 6 | 2 | 0 | 4 |
| **15. Detection of contamination** | 18 | 2 | 4 | 12 |
| **16. Pest control in food industry** | 8 | 2 | 0 | 6 |
| **17. Personal hygiene** | 12 | 2 | 0 | 10 |
| **18. HACCP system** | 14 | 6 | 0 | 8 |
| **19. Preparation of the HACCP plan** | 30 | 0 | 16 | 14 |

| | | | | |
|---|---|---|---|---|
| **20. Food safety management system** | 14 | 6 | 0 | 8 |
| **21. Management systems – documentation** | 30 | 0 | 20 | 10 |
| **22. Legislative requirements for food of animal and plant origin** | 18 | 2 | 6 | 10 |
| **TOTAL** | **326** | 60 | 70 | **196** |

## Study Plan for module "Food Safety Management" in Tajikistan

| **Themes** | **Number of hours** SK/UZB/TJ | | | |
|---|---|---|---|---|
| | Total | Lectures | Practical works | Independent work of the student |
| **1. Introduction to food safety** | 14 | 4 | 2 | 8 |
| **2. Rapid Alert System for Food and Feed (RASFF)** | 18 | 4 | 2 | 12 |
| **3. Biological safety** | 20 | 4 | 4 | 12 |
| **4. Food Hygiene and safety** | 16 | 2 | 4 | 10 |
| **5. Food-borne diseases (Zoonoses)** | 12 | 2 | 2 | 8 |
| **6. Food fraud and food authenticity** | 10 | 2 | 2 | 6 |
| **7. Chemical safety** | 12 | 4 | 2 | 6 |
| **8. Food labelling** | 10 | 2 | 2 | 6 |
| **9. Novel food** | 11 | 2 | 2 | 7 |
| **10. Sanitation in food industry** | 12 | 4 | 2 | 6 |
| **11. Disinfection methods** | 16 | 4 | 2 | 10 |
| **12. Sanitation program** | 16 | 2 | 4 | 10 |
| **13. Microbial biofilms in food industry** | 10 | 2 | 2 | 6 |
| **14. Genetically modified foods** | 6 | 2 | 2 | 2 |
| **15. Detection of contamination** | 18 | 2 | 4 | 12 |

| | | | | |
|---|---|---|---|---|
| **16. Pest control in food industry** | 8 | 2 | 2 | 4 |
| **17. Personal hygiene** | 12 | 2 | 2 | 8 |
| **18. HACCP system** | 14 | 6 | 2 | 6 |
| **19. Preparation of the HACCP plan** | 30 | 2 | 16 | 12 |
| **20. Food safety management system** | 14 | 4 | 4 | 6 |
| **21. Management systems – documentation** | 30 | 2 | 18 | 10 |
| **22. Legislative requirements for food of animal and plant origin** | 18 | 2 | 6 | 10 |
| **TOTAL** | **326** | 60 | 70 | **196** |

## Thematic Study Plan for module "Academic Writing"

| Date, Time | Study form | Theme | Lecturer |
|---|---|---|---|
| | **1. Introduction to food safety** | | |
| 1st day | Lectures (3 h) | Food Safety<br>Introduction and historical perspective | |
| | Practical works (2 h) | Major challenges of food safety | |
| | **2. Rapid Alert System for Food and Feed (RASFF)** | | |
| 2nd day | Lectures (2 h) | Rapid Alert System for Food and Feed (RASFF) - How does RASFF work | |
| | Lecture (1 h) | The RASFF Window | |
| | Practical work (3h) | The RASFF Consumers' Portal - working with portal | |
| | **3. Biological safety** | | |
| 3rd day | Lectures (2 h) | Biological safety - definition | |
| | Lectures (2 h) | Biological hazards in food - dividing of biological hazards, causes, examples | |
| | Practical work (4h) | Types of biological hazards in food and feed | |
| | **4. Food Hygiene and safety** | | |

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|---|---|---|---|
| 4th day | Lectures (2h) | Food Hygiene<br>Management of Food Safety and Hygiene | |
| | Practical works (3 h) | Consumer Perceptions of Risks from Food | |
| | **5. Food-borne diseases (Zoonoses)** | | |
| 5th day | Lectures (2 h) | Food-borne diseases | |
| | Practical works (2 h) | Challenges in Emerging Food-Borne Diseases | |
| | **6. Food fraud and food authenticity** | | |
| 6th day | Lecture (1 h) | Food fraud and food authenticity – definitions, examples of food fraud | |
| | Practical works (1 h) | Food authentication methods – food authenticity databases | |
| | **7. Chemical safety** | | |
| 7th day | Lectures (2 h) | Chemical safety – chemical hazards in food | |
| | Lectures (2 h) | Contaminants<br>Residues of veterinary medicinal products | |
| | Lecture (1h) | Food Contact Materials | |
| | **8. Food labelling** | | |
| 8th day | Lecture (1h) | Food supplements. Addition of vitamins and minerals | |
| | Lecture (1h) | Food information to consumers - legislation | |
| | Practical work (2 h) | Labelling - Food Labelling Information System | |
| | **9. Novel food** | | |
| 9th day | Lecture (1h) | Novel Food, authorisations and legislation | |
| | Lecture (1 h) | Nanomaterials in food | |
| | Practical work (2h) | Novel Food status Catalogue | |
| | **10. Sanitation in food industry** | | |
| 10th day | Lectures (2 h) | Sanitation – introduction, definitions | |
| | Lectures (2 h) | Cleaning and disinfection | |
| | **11. Disinfection methods** | | |
| 11th day | Lectures (2 h) | Chemical methods of disinfection – application advantages, disadvantages | |
| | Lectures (1 h) | Physical methods of disinfection – application advantages, disadvantages | |

| | | | |
|---|---|---|---|
| | Practical work (2 h) | Examples of disinfection. Choosing the appropriate disinfectant | |
| | **12. Sanitation program** | | |
| 12th day | Lectures (2 h) | Sanitation program - content and methodology of the sanitation program | |
| | Practical work (4 h) | Preparing of Sanitation program | |
| | **13. Microbial biofilms in food industry** | | |
| 13th day | Lectures (2 h) | Biofilm risks in food processing<br>Biofilm Formation on Food Processing Surfaces | |
| | Lecture (1 h) | Biofilm removal methods | |
| | **14. Genetically modified foods** | | |
| 14th day | Lectures (2 h) | Genetically modified foods – safety and risks | |
| | **15. Detection of contamination** | | |
| 15th day | Lectures (2 h) | Surface Sampling and the Detection of Contamination | |
| | Practical work (3 h) | Detection of contamination | |
| | **16. Pest control in food industry** | | |
| 16th day | Lectures (2h) | Pest control in food industry - rodent control, insect control. Prevention, methods of pest control | |
| | **17. Personal hygiene** | | |
| 17th day | Lectures (2h) | Personal hygiene rules | |
| | **18. HACCP system** | | |
| 18th day | Lectures (6 h) | HACCP System and Implementation | |
| | **19. Preparation of the HACCP plan** | | |
| 19th day | Practical work (8 h) | Preparation of the HACCP plan | |
| 20th day | Practical work (8 h) | Preparation of the HACCP plan | |
| | **20. Food safety management system** | | |
| 21st day | Lecture (1h) | Food safety management system.<br>Food safety management systems – introduction, basic terms and definitions, process principle | |
| | Lecture (5h) | Food safety management system – Context of the organisation, leadership, planning, support, operation, performance evaluation, improvement | |
| | **21. Management systems – documentation** | | |

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|---|---|---|---|
| 22nd day | Practical work (4h) | Food safety management system – documentation | |
| 23rd day | Practical work (8h) | Management systems - documentation. Solving practical tasks. | |
| 24th day | Practical work (8h) | Management systems - documentation. Solving practical tasks. | |
| | **22. Legislative requirements for food of animal and plant origin** | | |
| 25th day | Lectures (2 h) | Legislative requirements for food of animal and plant origin | |
| 26th day | Practical work (4 h) | Laboratory examination of meat products | |
| | Practical work (3 h) | Laboratory examination of milk and dairy products | |

## Themes and their summary in study module "Food Safety Management"

## Theme 1. Introduction to food safety

### Issues to be covered in the lectures

1. Significance of food safety.
2. Historical perspective of food safety.
3. A public health priority and a global responsibility.
4. Regulatory framework and standards.

### Issues to be covered in the practical or laboratory works and seminars

1. The best way to address food safety.
2. Questionnaire on food safety.

### Topics of independent work

1. Designing solutions for deficiencies in food safety.
2. Preparation and evaluation of questionnaires related to the issue of food safety.

### Literature and data bases on the theme


1. Ahmad, R. S. (2023). Food safety - new insights. In *IntechOpen eBooks*. https://doi.org/10.5772/intechopen.111039
2. Bricher, J. L. (2022). Introduction. In *Elsevier eBooks* (pp. 1–3). https://doi.org/10.1016/b978-0-12-816011-4.00012-4
3 . Kasuga, F. (2022). Climate change: food safety challenges in the near future. In *Elsevier eBooks* (pp. 1113–1124). https://doi.org/10.1016/b978-0-12-819470-6.00019-6
4. Vasiyev, M.G. (2012). Fundamentals of food technology.
5. Karimov, N.Q., Muhamadiyev, Sh., Karimova, M. (2019). Food chemistry.Textbook. - Samarkand: SamDU. https://arm.ssuv.uz/frontend/web/books/6423d7da89efd.pdf
6. Abdug'aniyev A., Abdug'aniyev A.A. (2004). Agrarian policy and food security - (textbook) - T.: TDIU.

## Theme 2. Rapid Alert System for Food and Feed (RASFF)

**Issues to be covered in the lectures**

1. What is RASFF?
2. Why is RASFF important?
3. How does RASFF work?
4. RASFF notification

**Issues to be covered in the practical or laboratory works and seminars**

1. RASFF window.
2. The RASFF Consumers' Portal.

**Topics of independent work**

1. Individual work with RASFF portal.
2. Comparison of RASFF reports between individual countries.

**Literature and data bases on the theme**


1. RASFF. (n.d.). Food Safety. https://food.ec.europa.eu/safety/rasff_en#Related
2. BVL - The European Rapid Alert System for Food and Feed (RASFF) (bund.de)
3. Nogales, A., Mora-Cantallops, M., Morón, R. D., & García-Tejedor, Á. J. (2022). Network analysis for food safety: Quantitative and structural study of data gathered through the RASFF system in the European Union. *Food Control*, *145*, 109422. https://doi.org/10.1016/j.foodcont.2022.109422
4. Орипов, Р.О. ва бошкалар. (1991). Кишлок хужалиги махсулотларини саклаш ва кайта ишлаш технологияси.
5. Расулов, А. (1995). Сабзавот, картошка ва полиз ма\сулотларини саклаш.
6. Х-Буриев, Р.Ризаев, Р. (1996). Мева, узум махсулотлари биокимёси ва технологияси.


## Theme 3. Biological safety

**Issues to be covered in the lectures**

1. Biological hazards in food.
2. Types of biological hazards.
3. Where are biological hazards commonly found?
4. What can biological hazards in food cause?

**Issues to be covered in the practical or laboratory works and seminars**

1. Types of biological hazards in food (Food of animal origin, Food of non-animal origin).
2. Examples of biological hazards in food.
3. Which food safety practice will help prevent biological hazards?

**Topics of independent work**

1. Evaluation of biological safety at food production.
2. Proposal of preventive measures against biological hazards.

**Literature and data bases on the theme**


1. Biological safety. Biological safety - European Commission (europa.eu)
2. 4 Major Biological Hazards in Food: Causes, Examples, Prevention Tips. 4 Major Biological Hazards in Food: Causes, Examples, Prevention Tips (fooddocs.com)
3. Latronico, F., Correia, S., Da Silva Felicio, T., Hempen, M., Messens, W., Ortiz-Pelaez, A., Stella, P., Liebana, E., & Hugas, M. (2017). Challenges and prospects of the European Food Safety Authority biological hazards risk assessments for food safety. *Current Opinion in Food Science*, *18*, 50–55. https://doi.org/10.1016/j.cofs.2017.10.013
4. Hu, X., Xu, B., Xiao, Y., Liang, S., Zhang, C., & Song, H. (2022). Overview and prospects of food biosafety. *Journal of Biosafety and Biosecurity*, *4*(2), 146–150. https://doi.org/10.1016/j.jobb.2022.11.001
5. Khujam, N.A, Davronov K.D. (2014). Biotechnology of food and feed products. Textbook.
6. Karimov, M., Muhamadiyev, N.Q., Karimova, Sh.M. (2019). Food chemistry. Textbook. https://arm.ssuv.uz/frontend/web/books/6423d7da89efd.pdf
7. Vasiyev, M. G'., Dadayev, Q.O., Isaboyev, I.B., Sapayeva, Z. Sh. (2012). G'ulomova Tashkent "Voris Nashriyot". Fundamentals of food technology.


## Theme 4. Food hygiene and safety

**Issues to be covered in the lectures**

1. Principles of food hygiene.
2. Primary production.
3. Environmental control.
4. Hygienic production.

**Issues to be covered in the practical or laboratory works and seminars**

1. How can you maintain food safety and hygiene?
2. Food handling practices for food – practical tasks.

**Topics of independent work**

1. Proposal of preventive measures related to food hygiene.
2. Determination of physical, chemical and microbiological risks in food production and the possibilities of their removal.

**Literature and data bases on the theme**


1. Redmond, E. C., & Griffith, C. J. (2004). Consumer perceptions of food safety risk, control and responsibility. *Appetite*, *43*(3), 309–313. https://doi.org/10.1016/j.appet.2004.05.003
2. General principles of food hygiene (2011). fao.org/fao-who-codexalimentarius/sh-proxy/en/?lnk=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcodex%252FStandards%252FCXC%2B1-1969%252FCXC_001e.pdf
3. Motarjemi, Y. (2016). The Starting Point. In *Elsevier eBooks* (pp. 1–11). https://doi.org/10.1016/b978-0-08-100155-4.00001-7

4. Shayxova G.I., Bahritdinov Sh.S., Salomova F.I., Alimova R.R., G ‘ulomova Sh.X., Ermatov N.J., Shovaliyev I.X., Cho'lponov I.R., Azizova F.L., Kuriyazova S.M., Toshmatova G., Ibragimov T.I., Qurbanova X.A., Otajonov I.O. (2012). Food hygiene. https://e-library.namdu.uz/50%20%D0%A2%D0%B8%D0%B1%D0%B1%D0%B8%D0%B9%20%D1%84%D0%B0%D0%BD%D0%BB%D0%B0%D1%80/Ovqatlanish%20gigiyenasi.%20Shayxova%20G.I.pdf
5. Erbo’tayev I. (2005). General food sanitation and hygiee. https://www.ziyouz.com/books/kollej_va_otm_darsliklari/tibbiyot/Umimiy%20ovqatlanish,%20sanitariya%20va%20gigiyena%20(I.Erbo'tayev).pdf
6. Shukurov, Sh.T. Maksumov, Z.M. Bazarov. (2021). Sanitation and hygiene, 2021, https://kitob.sies.uz/frontend/web/kitob/kitob_0061933f9c50f82.pdf

## Theme 5. Food-borne diseases (Zoonoses)

### Issues to be covered in the lectures

1. What are zoonoses.
2. Monitoring of zoonoses in food and animals.

### Issues to be covered in the practical or laboratory works and seminars

1. Examples of zoonoses.
2. Antimicrobials - control against food borne pathogens.

### Topics of independent work

1. Study of materials about foodborne diseases.
2. Preparation of a proposal for preventive measures against zoonoses.

### Literature and data bases on the theme

1. *Food-borne diseases (Zoonoses).* (n.d.). Food Safety. https://food.ec.europa.eu/safety/biological-safety/food-borne-diseases-zoonoses_en
2. *Food, Nutrition and Agriculture 2000 - 26*. (n.d.). https://www.fao.org/3/X7133M/x7133m02.htm
3. Farid, N., Waheed, A., & Motwani, S. (2023). Synthetic and natural antimicrobials as a control against food borne pathogens: A review. *Heliyon*, *9*(6), e17021. https://doi.org/10.1016/j.heliyon.2023.e17021
4. Dadayev, S. (2006). Parasitology, 2006, 210 p.
5. Musaboyev,A.I., Bayjanov, A.Q. (2007). Infectious disease epidemiology and parasitology, 504 p.

## Theme 6. Food fraud and authenticity

### Issues to be covered in the lectures

1. Definition of food fraud.
2. Types of food fraud.
3. Reasons of food fraud.
4. Examples of food fraud.
5. The most common food fraud.

**Issues to be covered in the practical or laboratory works and seminars**

1. Methods of food authenticity – food authenticity databases.

**Topics of independent work**

1. Study of theoretical materials.
2. Work with PC – most often ways of food fraud.
3. Work with food authenticity databases.

**Literature and data bases on the theme**


1. Karoui, R. (2020). Food authenticity and fraud. In *Elsevier eBooks* (pp. 579–608). https://doi.org/10.1016/b978-0-12-813266-1.00013-9
2. Pustjens, A. M., Weesepoel, Y., & Van Ruth, S. M. (2015). Food Fraud and Authenticity. In *Elsevier eBooks* (pp. 3–20). https://doi.org/10.1016/b978-1-78242-447-5.00001-0
3. Knowledge Centre for Food Fraud and Quality. https://knowledge4policy.ec.europa.eu/food-fraud-quality_en
4. Normakhmatov, R. (2013). Food and goods quality expertise, 2013, 512p. https://book.iiau.uz/book?id=18403
5. Khudoy, T., Muhammadiev, N., Muminov, N., Shukurov, I. (2009). Basics of food production, 356p.
6. Abdug'aniyev A., Abdug'aniyev A.A. (2004). Agrarian policy and food security - (textbook) - T.: TDIU, 304 pages.


## Theme 7. Chemical safety

**Issues to be covered in the lectures**

1. Chemical hazards in food.
2. Dividing contaminants in food.
3. Residues of veterinary medical products.
4. Food contact materials.

**Topics of independent work**

1. Study of theoretical materials.

**Literature and data bases on the theme**


1. *Chemical safety*. (n.d.). Food Safety. https://food.ec.europa.eu/food-safety/chemical-safety_en
2. Groh, K. J., Geueke, B., Martin, O., Maffini, M., & Muncke, J. (2020). Overview of intentionally used food contact chemicals and their hazards. *Environment International*, *150*, 106225. https://doi.org/10.1016/j.envint.2020.106225.
3. *Types of chemical hazards in food - a white paper from Campden BRI*. (n.d.). https://www.campdenbri.co.uk/white-papers/chemical-hazards-food.php
4. Majidov, Q.X., Maxmudov, R.A., Maxmudov, Q.YU., Majidova. N.Q. (2020). Food chemistry and biochemistry, 244p.

# Theme 8. Food labelling

## Issues to be covered in the lectures

1. What is food labelling information system?
2. Food supplements.
3. Levels of vitamins and minerals in food supplements.
4. Law on food information to consumers.

## Issues to be covered in the practical or laboratory works and seminars

1. Food labelling information system.

## Topics of independent work

1. Work with labelling information system.
2. Study of food labelling information system.

## Literature and data bases on the theme


1. *Food Labelling Information System (FLIS)*. (n.d.). Food Safety. https://food.ec.europa.eu/food-safety/labelling-and-nutrition/food-labelling-information-system-flis_en
2. *Food information to consumers - legislation*. (n.d.). Food Safety. https://food.ec.europa.eu/food-safety/labelling-and-nutrition/food-information-consumers-legislation_en
3. Albert, J. (2010). Innovations in food labelling. ISBN 978-1-84569-759-4, 174 p.
4. Орипов, Р.О. ва бошкалар. (1991). Кишлок хужалиги махсулотларини саклаш ва кайта ишлаш технологияси.
5. Расулов. А. (1995). Сабзавот, картошка ва полиз ма\сулотларини саклаш.
6. Х-Буриев, Р.Ризаев, Р. (1996). Мева, узум махсулотлари биокимёси ва технологияси.
7. Широков, С.П. (1978). Технология хранения и переработки плодов и овощей.

## Theme 9. Novel food

### Issues to be covered in the lectures

1. What is novel food?
2. Request for a novel food authorisation.
3. Nanomaterials in food.

### Issues to be covered in the practical or laboratory works and seminars

1. Novel food status catalogue.

### Topics of independent work

1. Study of legislation about novel food.
2. Work with novel food catalouge.

### Literature and data bases on the theme


1. *Authorisation*. (n.d.). Internal Market, Industry, Entrepreneurship and SMEs. https://single-market-economy.ec.europa.eu/sectors/chemicals/reach/authorisation_en
2. *Novel Food*. (n.d.). Food Safety. https://food.ec.europa.eu/food-safety/novel-food_en
3. *Nanomaterials*. (n.d.). Food Safety. https://food.ec.europa.eu/food-safety/novel-food/nanomaterials_en
4. Орипов, Р.О. ва бошкалар. (1991). Кишлок хужалиги махсулотларини саклаш ва кайта ишлаш технологияси.
5. Расулов, А. (1995). Сабзавот, картошка ва полиз ма\сулотларини саклаш.
6. Х-Буриев, Р.Ризаев, Р. (1996). Мева, узум махсулотлари биокимёси ва технологияси.
7. Широков, С.П. (1978). Технология хранения и переработки плодов и овощей.


## Theme 10. Sanitation in food industry

### Issues to be covered in the lectures

1. Sanitation – definitions.
2. What is cleaning?
3. Dividing of cleaning.
4. Disinfection – dividing.
5. Factors affecting sanitation.

### Topics of independent work

1. Study of materials about sanitation.

### Literature and data bases on the theme


1. Stier, R. F. (2024, September 11). The basics of cleaning and sanitation in food plants. *Foodengineeringmag*. https://www.foodengineeringmag.com/articles/98657-the-basics-of-cleaning-and-sanitation-in-food-plants
2. Djukic, D., Veskovic Moracanin, S., Milijasevic, M., Babic, J., Faculty of Agronomy Cacak, University of Kragujevac, Cara Dusana 34, 32000 Cacak, Serbia, Institute of Meat Hygiene and Technology, Belgrade, Kacanskog 13, 11000 Belgrade, Serbia, & IMLEK AD, Tolminska 10, 24000 Subotica, Serbia. (2002). Food Safety and Food Sanitation [Review paper]. *Journal of Hygienic Engineering and Design*. https://keypublishing.org/jhed/wp-content/uploads/2020/07/03.-Dragutin-%C4%90uki%C4%87.pdf
3. Shayxova G.I., Bahritdinov Sh.S., Salomova F.I., Alimova R.R., G ‘ulomova Sh.X., Ermatov N.J., Shovaliyev I.X., Cho'lponov I.R., Azizova F.L., Kuriyazova S.M., Toshmatova G., Ibragimov T.I., Qurbanova X.A., Otajonov I.O. (2012). Food hygiene.
2. Erbo’tayev I. (2005). General food sanitation and hygiene 2005, 80p.
3. Shukurov, I.X., Maksumov, Sh.T., Bazarov, Z.M. (2021). Sanitation and hygiene, 260 p.


## Theme 11. Disinfection methods

### Issues to be covered in the lectures

1. Chemical methods of disinfection – advantages, disadvantages.
2. Physical methods of disinfection - advantages, disadvantages.
3. Mechanism of action.

### Issues to be covered in the practical or laboratory works and seminars

1. Examples of chemical and physical disinfection.
2. Selection of disinfection based on the material to be disinfected and the degree of contamination.

### Topics of independent work

1. Study of chemical and physical methods of disinfection.
2. Choice of disinfectants for different surfaces.
3. Proposal of disinfection method in the conditions of food processing operations.

### Literature and data bases on the theme


1. Artasensi, A., Mazzotta, S., & Fumagalli, L. (2021). Back to Basics: Choosing the Appropriate Surface Disinfectant. *Antibiotics*, *10*(6), 613. https://doi.org/10.3390/antibiotics10060613
2. Prestes, F. S., Yotsuyanagi, S. E., Alonso, V. P. P., & Nascimento, M. S. (2024). Dry sanitization in the food industry: A review. *Current Opinion in Food Science*, 101166. https://doi.org/10.1016/j.cofs.2024.101166

3. Holah, J. (2014). Cleaning and disinfection practices in food processing. In *Elsevier eBooks* (pp. 259–304). https://doi.org/10.1533/9780857098634.3.259
4. Орипов, Р.О. ва бошкалар. (1991). Кишлок хужалиги махсулотларини саклаш ва кайта ишлаш технологияси.
5. Расулов, А. (1995). Сабзавот, картошка ва полиз ма\сулотларини саклаш.
6. Х-Буриев, Р.Ризаев, Р. (1996). Мева, узум махсулотлари биокимёси ва технологияси.
7. Широков, С.П. (1978). Технология хранения и переработки плодов и овощей.

## Theme 12. Sanitation program

### Issues to be covered in the lectures

1. Sanitation methodology.
2. Content of sanitation program.
3. Keeping documentation on sanitation.
4. Responsibility for the implementation of sanitation.

### Issues to be covered in the practical or laboratory works and seminars

1. Preparation of sanitation program.

### Topics of independent work

1. Study of sanitation methodology.
2. Preparation sanitation program.

### Literature and data bases on the theme

1. Schmidt, R. H. & Food Science and Human Nutrition Department. (1997). Basic Elements of a Sanitation Program for Food Processing and Food Handling. In *Fact Sheet FS15* [PDF]. Florida Cooperative Extension Service. https://ucfoodsafety.ucdavis.edu/sites/g/files/dgvnsk7366/files/inline-files/26500.pdf
2. Hygiene and sanitation handbook. (2018). In *TABLE of CONTENTS*. https://ec.europa.eu/programmes/erasmus-plus/project-result-content/908fceb3-6d8d-43a0-bc76-d780aeb1a13b/Hygiene-Sanitation-Handbook_ENG.pdf
3. Shayxova G.I., Bahritdinov Sh.S., Salomova F.I., Alimova R.R., G ‘ulomova Sh.X., Ermatov N.J., Shovaliyev I.X., Cho'lponov I.R., Azizova F.L., Kuriyazova S.M., Toshmatova G., Ibragimov T.I., Qurbanova X.A., Otajonov I.O. (2012). Food hygiene. https://e-library.namdu.uz/50%20%D0%A2%D0%B8%D0%B1%D0%B1%D0%B8%D0%B9%20%D1%84%D0%B0%D0%BD%D0%BB%D0%B0%D1%80/Ovqatlanish%20gigiyenasi.%20Shayxova%20G.I.pdf
4. Erbo’tayev I. (2005). General Food sanitation and hygiene, 80 p.
5. Shukurov, Sh.T. Maksumov, Z.M. Bazarov. (2021). Sanitation and hygiene, 2021, https://kitob.sies.uz/frontend/web/kitob/kitob_0061933f9c50f82.pdf

## Theme 13. Microbial biofilms in food industry

**Issues to be covered in the lectures**

1. What are biofilms?
2. Formation of biofilm in the food industry.
3. Microorganisms in biofilms.
4. Strategies for controlling biofilm formation.
5. Methods of biofilm removal.

**Topics of independent work**

1. Study of materials about biofilms in food industry and methods of biofilms removal.

**Literature and data bases on the theme**


1. Olanbiwoninu, A., & Popoola, B. (2022). Biofilms and their impact on the food industry. Saudi Journal of Biological Sciences, 30(2), 103523. https://doi.org/10.1016/j.sjbs.2022.103523
2. Zhu, T., Yang, C., Bao, X., Chen, F., & Guo, X. (2022). Strategies for controlling biofilm formation in food industry. Grain & Oil Science and Technology, 5(4), 179–186. https://doi.org/10.1016/j.gaost.2022.06.003
3. Lu, J., Hu, X., & Ren, L. (2022). Biofilm control strategies in food industry: Inhibition and utilization. Trends in Food Science & Technology, 123, 103–113. https://doi.org/10.1016/j.tifs.2022.03.007
4. Орипов, Р.О. ва бошкалар. (1991). Кишлок хужалиги махсулотларини саклаш ва кайта ишлаш технологияси.
5. Расулов, А. (1995). Сабзавот, картошка ва полиз ма\сулотларини саклаш.
6. Х-Буриев, Р.Ризаев, Р. (1996). Мева, узум махсулотлари биокимёси ва технологияси.
7. Широков, С.П. (1978). Технология хранения и переработки плодов и овощей.


## Theme 14. Genetically modified organisms

**Issues to be covered in the lectures**

1. What are GMO?
2. History of GMO.
3. Concepts related to GMO.
4. Risks of genetically modified products.
5. Benefits of genetically modified products.
6. Marking of genetically modified products.

**Topics of independent work**

1. Study of materials related with GMO.

**Literature and data bases on the theme**

1. *Genetically Modified Organisms*. (n.d.). Food Safety. https://food.ec.europa.eu/plants/genetically-modified-organisms_en
2. Singh, R. B., Mishra, S., Saxena, P., Saxena, M., Priya, N., Smail, M. M., & Velluri, S. R. (2021). Genetically modified organisms and foods: perspectives and challenges. In *Elsevier eBooks* (pp. 493–505). https://doi.org/10.1016/b978-0-12-819815-5.00041-0
3. Zhang, C., Wohlhueter, R., & Zhang, H. (2016). Genetically modified foods: A critical review of their promise and problems. *Food Science and Human Wellness*, *5*(3), 116–123. https://doi.org/10.1016/j.fshw.2016.04.002
4. Karimov, N.Q., Muhamadiyev, Sh., Karimova, M. (2019). Food chemistry.Textbook. - Samarkand: SamDU. https://arm.ssuv.uz/frontend/web/books/6423d7da89efd.pdf

## Theme 15. Detection of contamination

**Issues to be covered in the lectures**

1. Cleanliness, Microbial Growth and Cross-Contamination.
2. Cleaning and the role of surface sampling.
3. Surface Sampling and Assessing Cleanlines.
4. Nonmicrobiological surface sampling.
5. Microbiological surface sampling.

**Issues to be covered in the practical or laboratory works and seminars**

1. Detection of contamination with microbiological methods – laboratory work.
2. Using direct and indirect methods (swabs, Petrifilm plates).
3. Evaluation of the results.

**Topics of independent work**

1. Study of materials about detection of contamination.
2. Preparation of contamination detection methodology.

**Literature and data bases on the theme**

1. Griffith, C. (2016). Surface Sampling and the Detection of Contamination. In *Elsevier eBooks* (pp. 673–696). https://doi.org/10.1016/b978-0-08-100155-4.00044-3
2. Ferone, M., Gowen, A., Fanning, S., & Scannell, A. G. M. (2020). Microbial detection and identification methods: Bench top assays to omics approaches. *Comprehensive Reviews in Food Science and Food Safety*, *19*(6), 3106–3129. https://doi.org/10.1111/1541-4337.12618
3. Орипов, Р.О. ва бошкалар. (1991). Кишлок хужалиги махсулотларини саклаш ва кайта ишлаш технологияси.
5. Расулов, А. (1995). Сабзавот, картошка ва полиз ма\сулотларини саклаш.
6. Х-Буриев, Р.Ризаев, Р. (1996). Мева, узум махсулотлари биокимёси ва технологияси.

## Theme 16. Pest control in food industry

### Issues to be covered in the lectures

1. The Importance of Pest Management.
2. Strategies of Effective Pest Control.
3. Rodent control – characterisation of rodents, preventive and repressive methods.
4. Insect control - characterisation of rodents, preventive and repressive methods.

### Topics of independent work

1. Characterisation of pests in food industry.
2. Study of materials.

### Literature and data bases on the theme


1. Battersby, S., Chartered Institute of Environmental Health, & National Pest Advisory Panel. (2009). Pest control procedures in the food industry. In *Pest control procedures in the food industry* (p. 2). https://fumapest.com.au/pdf/Pest%20Control%20in%20the%20Food%20Premises%20-%20UK%20Chartered%20Institute%20of%20Environment%20Health.pdf
2. Theadmin. (2023, August 1). *Critical Pest Management in the Food Industry*. Kassar Group. https://kassargroup.com/2023/02/13/critical-pest-management-in-the-food-industry/
3. Subaitha, Z. A., Santhoshkumar, P., Moses, J., & Loganathan, M. (2023). Nonchemical strategies for stored product pest management: Exploring the potential of spices, herbs, and their formulations. *Food Control*, *158*, 110212. https://doi.org/10.1016/j.foodcont.2023.110212
4. Орипов, Р.О. ва бошкалар. (1991). Кишлок хужалиги махсулотларини саклаш ва кайта ишлаш технологияси.
5. Расулов, А. (1995). Сабзавот, картошка ва полиз ма\сулотларини саклаш.
6. Х-Буриев, Р.Ризаев, Р. (1996). Мева, узум махсулотлари биокимёси ва технологияси.
7. Широков, С.П. (1978). Технология хранения и переработки плодов и овощей.


## Theme 17. Personal hygiene

### Issues to be covered in the lectures

1. Definition of personal hygiene.
2. People as sources of contamination.
3. Management practices for controlling contamination.

### Topics of independent work

1. Study of theoretical materials.

**Literature and data bases on the theme**


1. Margas, E., & Holah, J. (2014). Personal hygiene in the food industry. In *Elsevier eBooks* (pp. 408–440). https://doi.org/10.1533/9780857098634.3.408
2. Xun, Y., Shi, Q., Yang, N., Yang, N., Li, Y., Si, W., Shi, Q., Wang, Z., Liu, X., Yu, X., Zhou, Q., Yang, M., & Chen, Y. (2021). Associations of hand washing frequency with the incidence of illness: a systematic review and meta-analysis. *Annals of Translational Medicine*, *9*(5), 395. https://doi.org/10.21037/atm-20-6005
1. Shayxova G.I., Bahritdinov Sh.S., Salomova F.I., Alimova R.R., G ‘ulomova Sh.X., Ermatov N.J., Shovaliyev I.X., Cho'lponov I.R., Azizova F.L., Kuriyazova S.M., Toshmatova G., Ibragimov T.I., Qurbanova X.A., Otajonov I.O. (2012). Food hygiene. https://e-library.namdu.uz/50%20%D0%A2%D0%B8%D0%B1%D0%B1%D0%B8%D0%B9%20%D1%84%D0%B0%D0%BD%D0%BB%D0%B0%D1%80/Ovqatlanish%20gigiyenasi.%20Shayxova%20G.I.pdf
2. Erbo’tayev I. (2005). General food sanitation and hygiee. https://www.ziyouz.com/books/kollej_va_otm_darsliklari/tibbiyot/Umimiy%20ovqatlanish,%20sanitariya%20va%20gigiyena%20(I.Erbo'tayev).pdf
3. Shukurov, I.X., Maksumov, Sh.T., Bazarov, Z.M. (2021). Sanitation and hygiene, 260 p.


## Theme 18. HACCP system

**Issues to be covered in the lectures**

1. What is the HACCP system, and what are its primary objectives in food safety management?
2. Describe the seven principles of HACCP.
3. Explain the role of critical control points in a HACCP plan.

**Issues to be covered in the practical or laboratory works and seminars**

1.How do you identify hazards in a HACCP plan?
2. What are the criteria for determining critical control points in a food production process?
3. Discuss the methods for monitoring critical control points.
4. Provide an example of a corrective action in a HACCP system.

**Topics of Independent Work**

1. Study of the impact of hazard analysis on food safety in a HACCP system.

**Literature and Data Bases on the Theme**


1. CAC/RCP 1: 2003 Recommended international code of practice – General principles of food hygiene. www.codexalimentarius.net/download/standards/23/cxp_001e.pdf.
2. Gombas, D.E., Stevenson,K.R. (2000). HACCP Verifikation and Validation: An Advanced HACCP Workshop. Washington DC – USA, Food Processors Institute, p. 27-31.
3. Hulebak, K., Schlosser, W. (2002). Hazard Analysis and Critical Control Point (HACCP) History and Conceptual Overview. In *Risk Analysis*, 22(3), p. 547-552. ISSN 0272-4332.
4. Орипов, Р.О. ва бошкалар. (1991). Кишлок хужалиги махсулотларини саклаш ва кайта ишлаш технологияси.
5. Расулов, А. (1995). Сабзавот, картошка ва полиз ма\сулотларини саклаш.
6. Х-Буриев, Р.Ризаев, Р. (1996). Мева, узум махсулотлари биокимёси ва технологияси.
7. Широков, С.П. (1978). Технология хранения и переработки плодов и овощей.

## Theme 19. Preparation of HACCP plan

### Issues to be covered in the lectures

1. What are the preliminary steps necessary for developing a HACCP plan?
2. Discuss the importance of assembling a HACCP team and describe the roles of its members.
3. How do you conduct a hazard analysis for a HACCP plan?

### Issues to be covered in the practical or laboratory works and seminars

1. Create a flow diagram for a selected food process and identify potential hazards.
2. Define critical limits for one of the critical control points identified in your flow diagram.
3. Describe the verification processes used in HACCP to ensure the plan's effectiveness.
4. Develop a record-keeping system suitable for documenting a HACCP plan.

### Topics of independent work

1. Case study analysis of an existing HACCP plan in a local restaurant or food manufacturing plant.
2. Design a HACCP plan for a new food product from concept to market.
3. Evaluate the effectiveness of different monitoring and verification strategies in various HACCP plans.

### Literature and Data Bases on the Theme

1. Griffiths, A.O. (2005). HACCP Works, Doncaster - England - Highfield.co.uk Ltd, (110 p). ISBN 1 904 544 363.
2. Guidelines for the Application of a HACCP System" by Codex Alimentarius.
3. Access to the HACCP database through SUA, focusing on case studies and regulatory requirements.

## Theme 20. Food safety management system

### Issues to be covered in the lectures

1. What is a Food Safety Management System (FSMS), and why is it critical in the food industry?
2. Explain the role of ISO 22000 standards in food safety management.
3. Describe the integration of HACCP principles within a broader FSMS.

### Issues to be covered in the practical or laboratory works and seminars

1. Assess the current food safety policies of a local food service establishment and suggest improvements.
2. Design a basic FSMS plan for a small-scale food production unit, incorporating critical control points.
3. Role-play an audit process to verify compliance with food safety standards.
4. Develop a training session for employees on effective food safety practices.

### Topics of independent work

1. Analyze the differences between FSMS certifications such as ISO 22000, FSSC 22000, and BRC.
2. Conduct a case study on the implementation challenges of FSMS in developing countries.
3. Evaluate the impact of FSMS on consumer trust and business sustainability.

**Literature and data bases on the theme**

1. Arvanitoyannis, I. S., Palaiokostas, C., & Panagiotaki, P. (2008). A Comparative Presentation of Implementation of ISO 22000 Versus HACCP and FMEA in a Small Size Greek Factory Producing Smoked Trout: A Case Study. *Critical Reviews in Food Science and Nutrition*, *49*(2), 176–201. https://doi.org/10.1080/10408390701856058.
2. STN EN ISO 22000: 2018. Food safety management systems. Requirements for food chain organizations.
3. ISO/TS 22003 Food safety management systems – Requirements for bodies providing audit and certification of food safety management systems.
4. Орипов, Р.О. ва бошкалар. (1991). Кишлок хужалиги махсулотларини саклаш ва кайта ишлаш технологияси.
5. Расулов, А. (1995). Сабзавот, картошка ва полиз ма\сулотларини саклаш.
6. Х-Буриев, Р.Ризаев, Р. (1996). Мева, узум махсулотлари биокимёси ва технологияси.
7. Широков, С.П. (1978). Технология хранения и переработки плодов и овощей.

## Theme 21. Management systems - documentation

**Issues to be covered in the lectures**

1. What are the key components of documentation in management systems?
2. How does effective documentation support compliance and operational efficiency in organizations?
3. Discuss the role of digital tools and software in the management of system documentation.

**Issues to be covered in the practical or laboratory works and seminars**

1. Create a document control procedure for a hypothetical management system.
2. Analyze a set of existing management documents and identify areas for improvement.
3. Simulate the process of document revision and approval in a management system.
4. Develop a training module on the importance and use of documentation for new employees.

**Topics of Independent Work**

1. Case study on the evolution of documentation practices in management systems over the last decade.
2. Design a digital dashboard for tracking and updating critical documents in a management system.
3. Research on the impact of poor documentation practices on organizational risk and quality management.

**Literature and data bases on the theme**

1. Foundation for food safety certification. (2008). Food Safety System Certification 22000 – FSSC 22000. Certification scheme for food safety systems of Food manufacturing based on ISO 22000: 2005 and BSI-PAS 220: 2008. Part IV. Requirements for the board of stakeholders.1st edition.. Gorinchem, the Netherlands [online]. Foundation for Food Safety Certification www.fssc22000.com. http://www.fssc22000.com/downloads/partIV.pdf .

2. STN EN ISO 22000: 2018. Food safety management systems. Requirements for food chain organizations.
3. ISO/TS 22003 Food safety management systems – Requirements for bodies provideing audit and certification of food safety management systems.
4. Орипов, Р.О. ва бошкалар. (1991). Кишлок хужалиги махсулотларини саклаш ва кайта ишлаш технологияси.
5. Расулов, А. (1995). Сабзавот, картошка ва полиз ма\сулотларини саклаш.
6. Х-Буриев, Р.Ризаев, Р. (1996). Мева, узум махсулотлари биокимёси ва технологияси.
7. Широков, С.П. (1978). Технология хранения и переработки плодов и овощей.

## Theme 22. Legislative requirements for food of animal and plant origin

### Issues to be covered in the lectures

1. Hygiene rules for food of animal origin.
2. Meat hygiene.
3. Milk hygiene.
4. Table eggs hygiene.
5. Safety of honey.
6. Safety of food of plant origin.

### Issues to be covered in the practical or laboratory works and seminars

1. Laboratory examination of meat and meat products – analyse of salts, microbial examination.
2. Laboratory examination of milk and dairy products.

### Topics of independent work

1. Study of theoretical materials.
2. Preparing of protocols from analyses.

### Literature and data bases on the theme

1. *Hygiene rules for food of animal origin | EUR-Lex*. (n.d.). https://eur-lex.europa.eu/EN/legal-content/summary/hygiene-rules-for-food-of-animal-origin.html
2. *Products of animal origin for human consumption*. (n.d.). Food Safety. https://food.ec.europa.eu/animals/animal-products-movements/products-animal-origin-human-consumption_en
3. Lin, X., Duan, N., Wu, J., Lv, Z., Wang, Z., & Wu, S. (2023). Potential food safety risk factors in plant-based foods: Source, occurrence, and detection methods. *Trends in Food Science & Technology*, *138*, 511–522. https://doi.org/10.1016/j.tifs.2023.06.032
4. Орипов, Р.О. ва бошкалар. (1991). Кишлок хужалиги махсулотларини саклаш ва кайта ишлаш технологияси.
5. Расулов, А. (1995). Сабзавот, картошка ва полиз ма\сулотларини саклаш.
6. Х-Буриев, Р.Ризаев, Р. (1996). Мева, узум махсулотлари биокимёси ва технологияси.
7. Широков, С.П. (1978). Технология хранения и переработки плодов и овощей.

## Literature sources

1. Ahmad, R. S. (2023). Food safety - new insights. In *IntechOpen eBooks*. https://doi.org/10.5772/intechopen.111039
2. Bricher, J. L. (2022). Introduction. In *Elsevier eBooks* (pp. 1–3). https://doi.org/10.1016/b978-0-12-816011-4.00012-4
3 . Kasuga, F. (2022). Climate change: food safety challenges in the near future. In *Elsevier eBooks* (pp. 1113–1124). https://doi.org/10.1016/b978-0-12-819470-6.00019-6
4. Vasiyev, M.G. (2012). Fundamentals of food technology.
5. Karimov, N.Q., Muhamadiyev, Sh., Karimova, M. (2019). Food chemistry.Textbook. - Samarkand: SamDU. https://arm.ssuv.uz/frontend/web/books/6423d7da89efd.pdf
6. Abdug'aniyev A., Abdug'aniyev A.A. (2004). Agrarian policy and food security - (textbook) – T.: TDIU.
7. RASFF. (n.d.). Food Safety. https://food.ec.europa.eu/safety/rasff_en#Related
8. BVL - The European Rapid Alert System for Food and Feed (RASFF) (bund.de)
9. Nogales, A., Mora-Cantallops, M., Morón, R. D., & García-Tejedor, Á. J. (2022). Network analysis for food safety: Quantitative and structural study of data gathered through the RASFF system in the European Union. *Food Control*, *145*, 109422. https://doi.org/10.1016/j.foodcont.2022.109422
10. Орипов, Р.О. ва бошкалар. (1991). Кишлок хужалиги махсулотларини саклаш ва кайта ишлаш технологияси.
11. Расулов, А. (1995). Сабзавот, картошка ва полиз ма\сулотларини саклаш.
12. Х-Буриев, Р.Ризаев, Р. (1996). Мева, узум махсулотлари биокимёси ва технологияси.
13. Biological safety. Biological safety - European Commission (europa.eu)
14. 4 Major Biological Hazards in Food: Causes, Examples, Prevention Tips. 4 Major Biological Hazards in Food: Causes, Examples, Prevention Tips (fooddocs.com)
15. Latronico, F., Correia, S., Da Silva Felicio, T., Hempen, M., Messens, W., Ortiz-Pelaez, A., Stella, P., Liebana, E., & Hugas, M. (2017). Challenges and prospects of the European Food Safety Authority biological hazards risk assessments for food safety. *Current Opinion in Food Science*, *18*, 50–55. https://doi.org/10.1016/j.cofs.2017.10.013
16. Hu, X., Xu, B., Xiao, Y., Liang, S., Zhang, C., & Song, H. (2022). Overview and prospects of food biosafety. *Journal of Biosafety and Biosecurity*, *4*(2), 146–150. https://doi.org/10.1016/j.jobb.2022.11.001
17. Khujam, N.A, Davronov K.D. (2014). Biotechnology of food and feed products. Textbook.
18. Redmond, E. C., & Griffith, C. J. (2004). Consumer perceptions of food safety risk, control and responsibility. *Appetite*, *43*(3), 309–313. https://doi.org/10.1016/j.appet.2004.05.003
19. General principles of food hygiene (2011). fao.org/fao-who-codexalimentarius/sh-proxy/en/?lnk=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcodex%252FStandards%252FCXC%2B1-1969%252FCXC_001e.pdf
20. Motarjemi, Y. (2016). The Starting Point. In *Elsevier eBooks* (pp. 1–11). https://doi.org/10.1016/b978-0-08-100155-4.00001-7
21. Shayxova G.I., Bahritdinov Sh.S., Salomova F.I., Alimova R.R., G ‘ulomova Sh.X., Ermatov N.J., Shovaliyev I.X., Cho'lponov I.R., Azizova F.L., Kuriyazova S.M., Toshmatova G., Ibragimov T.I., Qurbanova X.A., Otajonov I.O. (2012). Food hygiene. https://e-library.namdu.uz/50%20%D0%A2%D0%B8%D0%B1%D0%B1%D0%B8%D0%B9%20%D1%84%D0%B0%D0%BD%D0%BB%D0%B0%D1%80/Ovqatlanish%20gigiyenasi.%20Shayxova%20G.I.pdf
22. *Food-borne diseases (Zoonoses).* (n.d.). Food Safety. https://food.ec.europa.eu/safety/biological-safety/food-borne-diseases-zoonoses_en
23. *Food, Nutrition and Agriculture 2000 - 26*. (n.d.). https://www.fao.org/3/X7133M/x7133m02.htm

24. Farid, N., Waheed, A., & Motwani, S. (2023). Synthetic and natural antimicrobials as a control against food borne pathogens: A review. *Heliyon*, *9*(6), e17021. https://doi.org/10.1016/j.heliyon.2023.e17021
25. Dadayev, S. (2006). Parasitology, 2006, 210 p.
26. Musaboyev,A.I., Bayjanov, A.Q. (2007). Infectious disease epidemiology and parasitology, 504 p.
27. Erbo'tayev I. (2005). General food sanitation and hygiene. https://www.ziyouz.com/books/kollej_va_otm_darsliklari/tibbiyot/Umimiy%20ovqatlanish,%20sanitariya%20va%20gigiyena%20(I.Erbo'tayev).pdf
28. Shukurov, Sh.T. Maksumov, Z.M. Bazarov. (2021). Sanitation and hygiene, 2021, https://kitob.sies.uz/frontend/web/kitob/kitob_0061933f9c50f82.pdf
29. Karoui, R. (2020). Food authenticity and fraud. In *Elsevier eBooks* (pp. 579–608). https://doi.org/10.1016/b978-0-12-813266-1.00013-9
30. Pustjens, A. M., Weesepoel, Y., & Van Ruth, S. M. (2015). Food Fraud and Authenticity. In *Elsevier eBooks* (pp. 3–20). https://doi.org/10.1016/b978-1-78242-447-5.00001-0
31. Knowledge Centre for Food Fraud and Quality. https://knowledge4policy.ec.europa.eu/food-fraud-quality_en
32. Normakhmatov, R. (2013). Food and goods quality expertise, 2013, 512p. https://book.iiau.uz/book?id=18403
33. Khudoy, T., Muhammadiev, N., Muminov, N., Shukurov, I. (2009). Basics of food production, 356p.
34. Abdug'aniyev A., Abdug'aniyev A.A. (2004). Agrarian policy and food security - (textbook) - T.: TDIU, 304 pages.
35. *Chemical safety*. (n.d.). Food Safety. https://food.ec.europa.eu/food-safety/chemical-safety_en
36. Groh, K. J., Geueke, B., Martin, O., Maffini, M., & Muncke, J. (2020). Overview of intentionally used food contact chemicals and their hazards. *Environment International*, *150*, 106225. https://doi.org/10.1016/j.envint.2020.106225.
37. *Types of chemical hazards in food - a white paper from Campden BRI*. (n.d.). https://www.campdenbri.co.uk/white-papers/chemical-hazards-food.php
38. Majidov, Q.X., Maxmudov, R.A., Maxmudov, Q.YU., Majidova. N.Q. (2020). Food chemistry and biochemistry, 244p.
39. *Food Labelling Information System (FLIS)*. (n.d.). Food Safety. https://food.ec.europa.eu/food-safety/labelling-and-nutrition/food-labelling-information-system-flis_en
40. *Food information to consumers - legislation*. (n.d.). Food Safety. https://food.ec.europa.eu/food-safety/labelling-and-nutrition/food-information-consumers-legislation_en
41. Albert, J. (2010). Innovations in food labelling. ISBN 978-1-84569-759-4, 174 p.
42. Широков, С.П. (1978). Технология хранения и переработки плодов и овощей.
43. *Authorisation*. (n.d.). Internal Market, Industry, Entrepreneurship and SMEs. https://single-market-economy.ec.europa.eu/sectors/chemicals/reach/authorisation_en
44. *Novel Food*. (n.d.). Food Safety. https://food.ec.europa.eu/food-safety/novel-food_en
45. *Nanomaterials*. (n.d.). Food Safety. https://food.ec.europa.eu/food-safety/novel-food/nanomaterials_en
46. Stier, R. F. (2024, September 11). The basics of cleaning and sanitation in food plants. *Foodengineeringmag*. https://www.foodengineeringmag.com/articles/98657-the-basics-of-cleaning-and-sanitation-in-food-plants

47. Djukic, D., Veskovic Moracanin, S., Milijasevic, M., Babic, J., Faculty of Agronomy Cacak, University of Kragujevac, Cara Dusana 34, 32000 Cacak, Serbia, Institute of Meat Hygiene and Technology, Belgrade, Kacanskog 13, 11000 Belgrade, Serbia, & IMLEK AD, Tolminska 10, 24000 Subotica, Serbia. (2002). Food Safety and Food Sanitation [Review paper]. *Journal of Hygienic Engineering and Design*. https://keypublishing.org/jhed/wp-content/uploads/2020/07/03.-Dragutin-%C4%90uki%C4%87.pdf
48. Artasensi, A., Mazzotta, S., & Fumagalli, L. (2021). Back to Basics: Choosing the Appropriate Surface Disinfectant. *Antibiotics*, *10*(6), 613. https://doi.org/10.3390/antibiotics10060613
49. Prestes, F. S., Yotsuyanagi, S. E., Alonso, V. P. P., & Nascimento, M. S. (2024). Dry sanitization in the food industry: A review. *Current Opinion in Food Science*, 101166. https://doi.org/10.1016/j.cofs.2024.101166
50. Holah, J. (2014). Cleaning and disinfection practices in food processing. In *Elsevier eBooks* (pp. 259–304). https://doi.org/10.1533/9780857098634.3.259
51. Schmidt, R. H. & Food Science and Human Nutrition Department. (1997). Basic Elements of a Sanitation Program for Food Processing and Food Handling. In *Fact Sheet FS15* [PDF]. Florida Cooperative Extension Service. https://ucfoodsafety.ucdavis.edu/sites/g/files/dgvnsk7366/files/inline-files/26500.pdf
52. Hygiene and sanitation handbook. (2018). In *TABLE of CONTENTS*. https://ec.europa.eu/programmes/erasmus-plus/project-result-content/908fceb3-6d8d-43a0-bc76-d780aeb1a13b/Hygiene-Sanitation-Handbook_ENG.pdf
53. Olanbiwoninu, A., & Popoola, B. (2022). Biofilms and their impact on the food industry. Saudi Journal of Biological Sciences, 30(2), 103523. https://doi.org/10.1016/j.sjbs.2022.103523
54. Zhu, T., Yang, C., Bao, X., Chen, F., & Guo, X. (2022). Strategies for controlling biofilm formation in food industry. Grain & Oil Science and Technology, 5(4), 179–186. https://doi.org/10.1016/j.gaost.2022.06.003
55. Lu, J., Hu, X., & Ren, L. (2022). Biofilm control strategies in food industry: Inhibition and utilization. Trends in Food Science & Technology, 123, 103–113. https://doi.org/10.1016/j.tifs.2022.03.007
56. *Genetically Modified Organisms*. (n.d.). Food Safety. https://food.ec.europa.eu/plants/genetically-modified-organisms_en
57. Singh, R. B., Mishra, S., Saxena, P., Saxena, M., Priya, N., Smail, M. M., & Velluri, S. R. (2021). Genetically modified organisms and foods: perspectives and challenges. In *Elsevier eBooks* (pp. 493–505). https://doi.org/10.1016/b978-0-12-819815-5.00041-0
58. Zhang, C., Wohlhueter, R., & Zhang, H. (2016). Genetically modified foods: A critical review of their promise and problems. *Food Science and Human Wellness*, *5*(3), 116–123. https://doi.org/10.1016/j.fshw.2016.04.002
59. Griffith, C. (2016). Surface Sampling and the Detection of Contamination. In *Elsevier eBooks* (pp. 673–696). https://doi.org/10.1016/b978-0-08-100155-4.00044-3
60. Ferone, M., Gowen, A., Fanning, S., & Scannell, A. G. M. (2020). Microbial detection and identification methods: Bench top assays to omics approaches. *Comprehensive Reviews in Food Science and Food Safety*, *19*(6), 3106–3129. https://doi.org/10.1111/1541-4337.12618
61. Battersby, S., Chartered Institute of Environmental Health, & National Pest Advisory Panel. (2009). Pest control procedures in the food industry. In *Pest control procedures in the food industry* (p. 2). https://fumapest.com.au/pdf/Pest%20Control%20in%20the%20Food%20Premises%20-%20UK%20Chartered%20Institute%20of%20Environment%20Health.pdf
62. Theadmin. (2023, August 1). *Critical Pest Management in the Food Industry*. Kassar Group. https://kassargroup.com/2023/02/13/critical-pest-management-in-the-food-industry/

63. Subaitha, Z. A., Santhoshkumar, P., Moses, J., & Loganathan, M. (2023). Nonchemical strategies for stored product pest management: Exploring the potential of spices, herbs, and their formulations. *Food Control*, *158*, 110212. https://doi.org/10.1016/j.foodcont.2023.110212
64. Margas, E., & Holah, J. (2014). Personal hygiene in the food industry. In *Elsevier eBooks* (pp. 408–440). https://doi.org/10.1533/9780857098634.3.408
65. Xun, Y., Shi, Q., Yang, N., Yang, N., Li, Y., Si, W., Shi, Q., Wang, Z., Liu, X., Yu, X., Zhou, Q., Yang, M., & Chen, Y. (2021). Associations of hand washing frequency with the incidence of illness: a systematic review and meta-analysis. *Annals of Translational Medicine*, *9*(5), 395. https://doi.org/10.21037/atm-20-6005
66. CAC/RCP 1: 2003 Recommended international code of practice – General principles of food hygiene. www.codexalimentarius.net/download/standards/23/cxp_001e.pdf.
67. Gombas, D.E., Stevenson,K.R. (2000). HACCP Verification and Validation: An Advanced HACCP Workshop. Washington DC – USA, Food Processors Institute, p. 27-31.
68. Hulebak, K., Schlosser, W. (2002). Hazard Analysis and Critical Control Point (HACCP) History and Conceptual Overview. In *Risk Analysis*, 22(3), p. 547-552. ISSN 0272-4332.
69. Griffiths, A.O. (2005). HACCP Works, Doncaster - England - Highfield.co.uk Ltd, (110 p). ISBN 1 904 544 363.
70. Guidelines for the Application of a HACCP System" by Codex Alimentarius.
71. Access to the HACCP database through SUA, focusing on case studies and regulatory requirements.
72. Arvanitoyannis, I. S., Palaiokostas, C., & Panagiotaki, P. (2008). A Comparative Presentation of Implementation of ISO 22000 Versus HACCP and FMEA in a Small Size Greek Factory Producing Smoked Trout: A Case Study. *Critical Reviews in Food Science and Nutrition*, *49*(2), 176–201. https://doi.org/10.1080/10408390701856058.
73. STN EN ISO 22000: 2018. Food safety management systems. Requirements for food chain organizations.
74. ISO/TS 22003 Food safety management systems – Requirements for bodies providing audit and certification of food safety management systems.
75. Foundation for food safety certification. (2008). Food Safety System Certification 22000 – FSSC 22000. Certification scheme for food safety systems of Food manufacturing based on ISO 22000: 2005 and BSI-PAS 220: 2008. Part IV. Requirements for the board of stakeholders.1st edition.. Gorinchem, the Netherlands [online]. Foundation for Food Safety Certification www.fssc22000.com. http://www.fssc22000.com/downloads/partIV.pdf .
76. STN EN ISO 22000: 2018. Food safety management systems. Requirements for food chain organizations.
77. ISO/TS 22003 Food safety management systems – Requirements for bodies providing audit and certification of food safety management systems.
78. *Hygiene rules for food of animal origin | EUR-Lex*. (n.d.). https://eur-lex.europa.eu/EN/legal-content/summary/hygiene-rules-for-food-of-animal-origin.html
79. *Products of animal origin for human consumption*. (n.d.). Food Safety. https://food.ec.europa.eu/animals/animal-products-movements/products-animal-origin-human-consumption_en
80. Lin, X., Duan, N., Wu, J., Lv, Z., Wang, Z., & Wu, S. (2023). Potential food safety risk factors in plant-based foods: Source, occurrence, and detection methods. *Trends in Food Science & Technology*, *138*, 511–522. https://doi.org/10.1016/j.tifs.2023.06.032

**Materials needed for the implementation of the study course program**

| Nr. | Material resources and equipment | Quantity / description |
|---|---|---|
| 1. | Internet access | |
| 2. | Access to databases | Scopus, Web of Science, Science Direct, PubMed |
| 3 | Literature sources (list provided) | |

**Methods used for the implementation of the study course program**

| Nr. | Themes | Methods possible to be applied |
|---|---|---|
| 1. | Food Safety, Biological, chemical hazards in Food | Work with Internet. Finding solutions to food safety issues. |
| 2. | Food authentication methods – food authenticity databases | Work with Authenticity databases |
| 3. | Labelling and novel food | Work with Food Labelling Information System |
| 4. | Sanitation program | Preparation of sanitation program |
| 4. | Detection of contamination | Microbial methods of detection of contamination |
| 5. | HACCP system | Preparation of HACCP plan |
| 6. | Food safety management system | Work with computer |
| 7. | Laboratory examination of food | Physical, chemical and microbiological analysis of milk and meat |
| 8. | Quality assessment of foodstuffs | Organoleptic, physico-chemical, microbiological, laboratory examination methods |
| 9. | Quality analysis of foodstuffs | Laboratory examination methods: refractometer, areometer, turbotimer |