# .- MITIGATION OF RISK IN FOOD PRODUCTION

## Prof. Giorgia Spigno

***COURSE AIMS AND INTENDED LEARNING OUTCOMES***

The overall aim of this course is to provide knowledge for a structured approach to develop a comprehensive risk management system in a food company, with a focus on food production. Students will be introduced to risk assessment and exploitation of the assessment results for definition and implementation of proper risk mitigation strategies, from food process and plant design, to process operation and control; selection and use of packaging materials and final product distribution. The course will also give an overview on risks indirectly associated to food production but that can compromise the business solidity, such as changes in consumer tastes, development of incorrect product design, mismatch in technological capabilities and market requirements; financial risks associated with various processes and practices, third party risks, risks associated with sharing intellectual property. The course will also introduce to software solutions nowadays available for food safety and risk assessment and management and related cybersecurity.

At the end of the course, students will know all the main risk sources in food production and the associated procedures and strategies for risk mitigation and management.

Based on the knowledge acquired, students will be able to: identify the risks associated to any food business, define appropriate risk management plan and select appropriate software to optimize risk containment and communication inside the food business and to all the pertinent stakeholders.

***COURSE CONTENT***

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|  | ECTS |
| Overview on the ISO 31000 standards relating to risk management: principles and guidelines on implementation, risk assessment techniques and vocabulary. Introduction to the importance of performing food industry risk assessments (as part of both regulatory compliance and third-party certification requirements) and to the role of different stakeholders of the food system. Overview on the ISO 22000 Food safety management systems- Requirements. | 1.0 |
| Overview on HACCP (Hazard Analysis Critical Control Points), VACCP (Vulnerability Assessment Critical Control Points), TACCP (Threat Assessment Critical Control Points), HARPC (Hazard Analysis & Risk-Based Preventive Controls) and their interconnections. | 0.5 |
| Food factory infrastructure and of food processing equipment (hygienic design, construction materials, verification and certification). Hygiene practices in food processing: cleaning and disinfection practices; cleaning in place (CIP); equipment maintenance. | 1.5 |
| Airborne contamination in food processing. Hygiene aspects related to the use of compressed air and food gases. Predictive microbiology for microbiological risk prediction and prevention. Risks associated to packaging materials.  | 1.5 |
| Other food business risks (changes in consumer tastes and market requirements, incorrect product design, financial risks, intellectual property rights, incorrect products related communication). Software solutions for food safety and risk assessment and management and related cybersecurity. | 0.5 |
| **Tutorials** | 1.00 |
| Seminars with company testimonials and EFSA experts on food risk evaluation and management. Assignment of group work on course topics. |  |

***READING LIST***

Predictive Modeling and Risk Assessment - Series: Integrating Food Science and Engineering Knowledge Into the Food Chain, Rui Costa Editor , 2009, Springer

Food Safety Management, 1st Edition, A Practical Guide for the Food Industry, Editors: Yasmine Motarjemi Huub Lelieveld, 2013, Academic Press

## Handbook of Hygiene Control in the Food Industry, 2nd Edition, Editors: H. L. M. Lelieveld John Holah Domagoj Gabric, 2016, Woodhead Publishing

Lecturer's notes.

Aids related to specific topics will be provided during the course.

***TEACHING METHOD***

1. Theoretical frontal and dialogue-based lectures aimed at presenting the key concepts of the subject.

2. Assignment of working groups for the resolution of specific case-studies related to the course topics.

3. Classroom seminars with company testimonials.

4. A possible educational visit to a food company.

***ASSESSMENT METHOD AND CRITERIA***

There will be a final written exam followed by possible oral discussion. Students will be indicatively given up to 2 hours to answer open-ended theoretical questions. On average, students will be given 4 open-ended questions and the teacher will also assess the student's appropriate use of the specific technical terminology used during the course. At the beginning of the course it will be indicated if group work will be carried out during the year, with an illustration of the topics and aims of the work, and the requirements of the final report (such as a PowerPoint presentation). Normally, the group work involves a literature research on specific topics covered in the course or resolution of assigned case-studies. The work groups may consist indicatively of a maximum of 5 students, and the contribution and role of each individual member must be explicitly indicated in the final report. The final report will be assessed with a mark out of 30. In the case of group work, the final mark will be taken as a weighted arithmetic mean of the mark obtained in the written test (with a 2/3 weight) and that obtained in the group work assessment (with a 1/3 weight). In the case of working students or students unable to participate in the group work, this must be communicated to the lecturer at the beginning of the course, who will then be able to provide appropriate alternative ways to cover this part of the programme.

***NOTES AND PREREQUISITES***

The student is expected to possess knowledge of the basic food hygiene management procedures in the food industry. If required, the student can ask the teacher for supplementary material related to this topic.

In case the current Covid-19 health emergency does not allow frontal teaching, remote teaching will be carried out through synchronous or asynchronous procedures that will be promptly notified to students

***OFFICE HOURS FOR STUDENTS***

Prof. Giorgia Spigno is available for the students after the lectures. In addition, she is available to receive students following specific appointment or through remote meetings. In any case, it is suggested to write an e-mail (giorgia.spigno@unicatt.it) to agree on the day and time of reception.