SAFE-ORGfood Project

Transnational Quality Education for Organic Food Safety

SAFE-ORGfood

Project No. 2020-1-PL01-KA203-081809

O4 - E-learning materials on organic food safety

Project timeframes: 1st December 2020 – 28th February 2023

SAFE-ORGfood coordinating institution: Warsaw University of Life Sciences – WULS (Poland). Project Partners: FH Münster University of Applied Sciences (Germany), University of Tuscia (Italy), Estonian University of Life Sciences (Estonia), University of Zagreb – Faculty of Agriculture (Croatia). Intellectual Output coordinating institution: Warsaw University of Life Sciences – WULS (Poland) and Estonian University of Life Sciences (Estonia). All Partners contributed towards the development of this Intellectual Output of the project. The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

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LECTURER: Prof. Mati Roasto, Estonian University of Life Sciences

TOPIC: Biological hazards in food

TEXT FOR VIDEO SLIDES:

Slide 1

Hello everybody this presentation is about biological hazards in food.

Slide 2

My name is Mati Roasto and I work at the Estonian University of Life Sciences as a professor of food hygiene and veterinary public health.

I have been working in this field for more than 20 years and I teach veterinary and food technology students' in food production hygiene and food microbiological safety.

Foodborne bacterial pathogens are my main research interests, but I have also worked with colleagues on the chemical food hazards and with the natural antimicrobial compunds which can be used as antimicrobials and antioxidants in food.

Slide 3

Each year in Europe more than 23 million people are falling ill while consuming unsafe food. World Health Organization estimates that norovirus is the most common cause of foodborne illness in the European region with close to 15 million cases each year, followed by *Campylobacter* spp., which is responsible for almost 5 million disease cases.

Salmonella spp. causes the majority of contaminated food consumption related deaths cases in Europe. Other major causes of deaths are *Campylobacter* spp., norovirus, *Listeria monocytogenes* and *Echinococcus multilocularis*.

Slide 4

Biological hazards in food can be pathogenic prions, viruses, bacteria, moulds. Also protozoa and other pathogenic parasites in food can cause foodborne diseases.

The problem is that the presence of pathogens in food cannot be usually recognized by the senses. We cannot detect pathogens in food through the eyes or by smelling or taste. Pathogens can be present in foods that seem completely hygienic and safe to us.

Slide 5

When microorganisms contaminate food, which causes foodborne disease, then these microorganisms are referred as foodborne pathogens.

Foodborne diseases are caused either by infectious agents or by toxin(s), mostly enterotoxins.

Foodborne diseases caused by biological hazards are either: foodborne infections or foodborne intoxications.

Slide 6

Most common foodborne pathogens are pathogenic bacteria such as *Salmonella*, *Campylobacter*, pathogenic *Escherichia coli*, *Listeria monocytogenes* and others.

There are also foodborne illness causing viruses like noroviruses, hepatitis A and E viruses, rotaviruses, and astroviruses.

Also food related protozoa such as *Toxoplasma gondii*, *Cryptosporidium*, *Giardia*, and additionally mycotoxins producing moulds can cause foodborne diseases.

Slide 7

Not always heat treatment can eliminate biological hazards in food. This is because many microorganisms can produce thermostable toxins into the food.

For example, enterotoxins can be produced by pathogenic *Escherichia coli* (STEC), *Clostridium perfringens*, *Bacillus cereus*, *Staphylococcus aureus*, *Shigella dysenteriae*, *Yersinia enterocolitica* and *Vibrio cholerae*.

Slide 8

Bacterial spores can be an even bigger food safety problem.

Spores can survive: high temperatures - for example boiling for up to 5 hours; also they can survive disinfection, dehydration and other treatments.

When the conditions become more favorable – for example presence of nutrients, water, suitable temperature, then the organism germinates from the spore and continues the multiplication in food.

Spore-forming bacteria are some well-known foodborne pathogens like *Bacillus cereus*, *Clostridium perfringens* and *Clostridium botulinum*.

Slide 9

The question may arise “How can the microbiological food safety be ensured?”

We can say that the key issues in ensuring food microbiological safety are:

The effectiveness of the self-control programs including prerequisite programs/good practices and food safety management systems.

There is need for adequate hazard analysis and control; validation and verification activities should be appropriate and generally HACCP system need to be effective.

Also, knowledge on food intrinsic (e.g. pH and aw), extrinsic (e.g. temperature and gas atmosphere) and implicit (e.g. competing microbiota) factors which influence the microbial growth in food is very important.

Also, personnel knowledge and positive attitude towards food hygiene and –safety is one of the key issue in ensuring food safety.

Slide 10

The most important intrinsic factors which influence the growth of microorganisms in food are pH, water activity, redox potential and antimicrobial ingredients in food.

The most important extrinsic factors influencing the microbial growth in food are temperature, packaging related gas composition and relative humidity.

Mostly the inhibition of microorganism's growth in foods is achieved while combing aforementioned intrinsic and extrinsic factors.

Slide 11

To prevent or minimize the biological hazards in foods, the food handler should:

Use raw materials and food ingredients of high quality and from reliable suppliers;

Implement Good Hygiene and Good Manufacturing Practices (GHP, GMP) and prevent (cross) contamination at all levels of food processing and handling;

Comply with the rules of personal hygiene, incl. proper hand washing;

Avoid bare-handed handling of ready-to-eat foods, and prohibit the handling of food by workers with disease symptoms or with skin infections;

Apply minimum of +74 °C inner (core) temperature in food to destroy vegetative cells of pathogenic microorganisms present in food;

Ensure the adherence to time and temperature regimes;

Ensure the compliance with established food safety and process hygiene criteria;

Verify that the self-control system is effective and food safety is ensured – this includes also food and environmental sampling to verify the compliance to food safety and process hygiene criteria;

Some other activities may be required depending on production type and food safety risk level.

Slide 12

Thank you for your attention.

Slide 13

Please also check other study materials on the SAFE-ORGfood project web-page.

MULTIPLE CHOICE QUESTION TEST

1. **The most common cause of foodborne illness is? Please select one correct answer.**
   A. *Campylobacter* spp.
   B. Rotavirus
   C. Listeria monocytogenes
   D. Norovirus

2. **Foodborne diseases are mainly causing ……? Please select one correct answer.**
   A. Skin infections
   B. Diarrhoeal diseases
   C. Systemic viral infections
   D. Cancer-causing infections

3. **Foodborne diseases caused by biological hazards are ….? Please select two correct answers.**
   A. Foodborne infections
   B. Food intolerances and allergies
   C. Nutritional disorders
   D. Foodborne intoxications

4. **Some foodborne pathogenic microorganisms can produce toxins into the food. Toxins present in food are often causing problems because they are often …. Please select one correct answer.**
   A. Unstable in food
   B. Causing food infections
   C. Causing food deterioration/spoilage
   D. Thermostable

5. **Bacterial spores in food are highly resistant to chemical and physical agents. True or false?**
   A. False
   B. True

6. **Most important intrinsic factors which influence the microbial growth in foods are? Please select 3 correct answers.**
   A. Temperature
   B. pH
   C. Packaging
   D. Water activity
   E. Antimicrobial ingredients in food

7. **Most important extrinsic factors which influence the microbial growth in foods are? Please select 2 correct answers.**
   A. pH
   B. Temperature
   C. Atmosphere e.g. packaging gas composition
   D. Water activity

Key of correct answers:

1: Norovirus (D)

2: Diarrhoeal diseases (B)

3: Foodborne infections (A) and foodborne intoxications (D)

4: Thermostable (D)

5: True (B)

6: pH (B); water activity (D); Antimicrobial ingredients in food (E)

7: Temperature (B); Atmosphere e.g. packaging gas composition (C)

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LECTURER: Mirna Mrkonjić Fuka

TOPIC: Mycotoxins and mycotoxicoses

TEXT FOR VIDEO SLIDES:

Slide 1

Hello to everyone. Today's lecture on mycotoxins and mycotoxicosis was made within the project funded by the Erasmus + Program of the European Union "Transnational Quality Education for Organic Food safety".

Slide 2

My name is Mirna Mrkonjić Fuka. I am full professor of microbiology at the University of Zagreb Faculty of Agriculture, with almost 20 years of experience in higher education, and my expertise is mainly related to the topics of food microbiology and soil microbiology.

Slide 3

First to answer the question What are mycotoxins? Those are toxic compounds that are produced by molds, and molds are microscopic fungi, as a part of their natural mechanism of defense against other microorganisms, animals and humans.

Slide 4

Mycotoxins are the cause of animal diseases called mycotoxicoses with a serious health threat to both, humans and animals. The adverse health effects of mycotoxins range from acute poisoning to long-term effects such as immune deficiency and cancer.

Exposure to mycotoxins can happen either directly by eating infected food or indirectly from animals that are fed contaminated feed, in particular from milk. To a lesser extent it can also occur after inhalation or the intake through the skin.

Slide 5

In what kind of food can we expect mycotoxins? In not all kind of food, however, cereals like corn, wheat and rice, different kind of oilseeds, spices, nuts, coffee beans, dry vine fruits and wine, apple and grape juice are especially prone to mycotoxins formation.

Here we must point out that we cannot see or smell mycotoxins, and that they can be present in food even though the mycotoxicogenic mold is no longer present.

Slide 6

The mycotoxins production depends on live organisms (microorganisms). Everything what effect the mold growth will also effect the biosynthesis of mycotoxins. As for example; environmental conditions such as temperature, oxygen concentrations and humidity as well as physicochemical properties of food itself, like pH, water activity, and food composition. They are influencing mold growth but also mycotoxins production. However, we must point out that mycotoxin production is largely dependent on the type of mold, and not every mold produces every type of mycotoxin.

Mold growth and mycotoxins production can occur either before or after harvest, during storage, on/in the food itself, often under warm and humid conditions.

Slide 7

Let's get the closer look, what are the growth conditions for the most common mycotoxins producing fungi. Different values of temperature, water activity and pH are necessary for the optimal growth of *Aspergillus*, *Penicillium*, and *Fusarium* species that are producing aflatoxins, ochratoxins, patulin, fumonisin and deoxynivalenol and those are commonly found mycotoxins in food. However, for example, the optimum temperature for the biosynthesis of most mycotoxins is in the range between 20 to 30°C and fungi itself, can grow at the much higher or at much lower temperature.

Slide 8

Very important question we have to answer is how the risk of mycotoxin contamination can be reduced?

Mycotoxins are "natural" contaminants of food, therefore their formation cannot be avoided completely. The most of the methods for controlling mycotoxins are largely preventive and include good agricultural practice. The formation of mycotoxins on field can be reduced by a number of procedures, as for example by growing resistant varieties, overturning crops, plowing the soil, chemical and biological methods of plant disease control and control the presence of insects.

The most appropriate methods include harvesting and storage conditions (like drying crops after harvest) and they are crucial to prevent growth of molds and accumulation of mycotoxins on harvested crops.

Of course, food processing can reduce the amount of mycotoxins, their degradation, elimination and transformation into less toxic derivatives, however, complete removal of mycotoxins from food chain through processing is difficult and expensive to achieve.

Slide 9

And to conclude.

Mycotoxins are naturally occurring toxic compounds of certain types of molds and can be found in crops and food including cereals, nuts, spices, dried fruits, apples, coffee beans and milk.

We need to distinguish between mycosis and mycotoxicoses. Both are diseases. However, mycosis is an infectious disease caused by pathogenic fungi while mycotoxicoses are diseases due to exposure to toxic fungal metabolites.

Mold usually does not grow in properly dried and stored food, so efficient drying and maintenance of the dry state, or proper storage, is an effective measure against mold growth and the production of mycotoxins.

Slide 10

Thank you for your attention.

The literature used for the preparation of this lecture is listed here.

All photos used in this lecture are in the Public Domain.

MULTIPLE CHOICE QUESTION TEST

1. **Mycotoxins are produced by:**
   A. Bacteria
   B. Molds
   C. Protozoa
   D. Yeasts
   E. Algae

2. **Mycotoxicoses are:**
   A. Infections caused by pathogenic fungi
   B. Animal diseases caused by mycotoxins
   C. Not harmful to humans
   D. Human diseases caused by eating moldy food
   E. Diseases caused by aflatoxins

3. **Exposure to mycotoxins happens via:**
   A. Food
   B. Inhalation
   C. Animals products
   D. Eating moldy food
   E. Nothing above is correct

4. **Optimum temperature range for mycotoxins production is:**
   A. 0-10° C
   B. 10-20° C
   C. 20-30° C
   D. 30-40° C

5. **Mycosis are:**
   A. Diseases caused by mycotoxins
   B. Diseases caused by pathogenic bacteria
   C. Diseases caused by pathogenic fungi
   D. Not harmful to humans
   E. Only A and C are correct

6. **To minimize the health risk from mycotoxins:**
   A. Keep food dry
   B. Keep food at high humidity
   C. Keep food at very warm
   D. Only A and C are correct
   E. Only B and C are correct

Key of correct answers:

1: B

2: B, E

3: A, B, C

4: C

5: C

6: A

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LECTURER: prof. MUAS Ursula Bordewick-Dell, Münster University of Applied Sciences

TOPIC: Allergen Management

TEXT FOR VIDEO SLIDES:

Slide 1

This presentation addresses allergen management

Slide 2

Hello, my name is Ursula Bordewick-Dell and I work at Münster University of Applied Sciences. There I teach biochemistry and food analysis. In this context, I am particularly concerned with food allergies and allergen management. I am therefore very pleased to be able to contribute this topic to the development of teaching materials on food safety as a part of an international Erasmus plus project.

Slide 3

Allergies are overreactions of the immune system that are triggered by so-called antigens. These are mainly proteins against which a defence reaction takes place, in which antibodies of the IgE class are involved in most cases. Typical symptoms, which usually occur very quickly, include redness, itching, swelling of the mucous membranes, nausea, vomiting, diarrhoea, a drop in blood pressure or – in the worst case – anaphylactic shock. Not all symptoms occur at the same time, but they vary from allergen to allergen and from person to person. Often, those who are affected find the symptoms unpleasant and annoying, but when the mucous membranes in the airways swell, suffocation can occur and anaphylactic shock can also be fatal.

Slide 4

In Europe, food allergies affect about 6 % of the population. The actual prevalence varies from country to country, as do the main allergens to which people react. In the worst case, even the smallest concentrations of an allergen can cause severe reactions. Allergen management should therefore be part of good hygiene practice to protect those affected. Food business operators should be able to recognise the allergic potential of their products, both in terms of ingredients and processing aids, and the risk of unintentional contamination.

Slide 5

Clear labelling of allergenic ingredients is very important to inform consumers. This way, affected can avoid buying and consuming products that could be dangerous for them. EU Regulation No. 1169/2011 – the so-called Food Labelling Regulation – summarises 14 groups of ingredients that either belong to the main allergens in the EU or cause food intolerances. These ingredients must be highlighted in the

list of ingredients, e.g. by bold print or italics. If there is no list of ingredients, as is the case with loose goods, for example, the allergens must still be clearly declared, for example by putting up a sign or displaying a brochure with the relevant information. If the allergenic ingredient is already apparent from the name of the product, the special labelling of the allergen can be omitted. For example, “milk” in milk chocolate would not have to be printed in bold type, nor would “nuts” in “hazelnut cream”.

Slide 6

This slide lists the 14 main allergen groups from Annex II of Regulation 1169/2011. It is important to note the addition “or their products”. For example, not only the whole egg must be labelled as an allergen, but also an egg yolk, egg white or lecithin obtained from egg. In the case of cereals and nuts, the types requiring labelling are specified even more precisely.

Slide 7

Food ingredients with allergic potential can be identified very well. However, unintentional contamination, which can occur during storage and transport of a food product, but also during its processing or use, poses a major challenge. If the same storage and transportation containers are used for different products, there is always the risk that despite cleaning, traces remain that can be transferred to the next product. The same applies if one and the same production line is used for several products or different products are used on the same work surface in a restaurant. Mix-ups and incorrect labelling are also conceivable. This and other contamination possibilities are listed in Codex Alimentarius CXC 80-2020. This brief provides a code of practice on food allergen management for food business operators.

Slide 8

The aim is to avoid accidental contamination with allergens. To this end, food, work surfaces, containers, transport vehicles and equipment of any kind should be thoroughly inspected by competent personnel. Samples and swabs should be taken for laboratory examination. A relatively inexpensive way to test for the presence of allergens is protein detection. If no proteins can be detected, no allergens are present in detectable amounts. The enzyme-linked immunosorbent assay (ELISA) or PCR is suitable for specific detection. In some cases, a lateral flow test can be used as a rapid test.

Slide 9

To protect themselves from the consequence of product liability, many manufacturers use the voluntary labelling “may contain traces of …”. This labelling leads to great uncertainty among consumers, because persons suffering from allergies will not buy a product labelled in this way, even if it is presumably allergen-free. Due to this fact, a mandatory trace labelling would be eligible.

Slide 10

In Australia and New Zealand, the VITAL 3.0 concept for trace labelling is used. Here, limit values are determined – so-called ED01 values – below which, according to current scientific findings, 99 % of all allergy sufferers tolerate a food without developing allergic symptoms. If the allergen content is above the limit, the allergen must be labelled. The limits known up to now are shown in the table. This concept could also form the basis for mandatory trace labelling within the EU. But questions are still open. For

example, the case has not been clarified if the allergen traces are unevenly distributed in a product. If, for example, mild chocolate is only contaminated with traces of nuts in some pieces, but not in whole. There is still need for further research here. Until then, trace labelling will continue to be voluntary.

Slide 11

Thank you for your attention. On the following slide you will find some scientific articles that were used to create this presentation. Furthermore, I recommend taking a look at Regulation (EU) No. 1169/2011 and the Codex Alimentarius CXC 80-2020. You are also welcome to take a look at the other teaching materials created by our SAFE-ORGfood working group. There you will find many tips and information on the topic of food safety in the production and processing of organic food.

Good bye!

MULTIPLE CHOICE QUESTION TEST

1. What are typical symptoms of a food allergy? Choose three correct answers.

A. Itching
B. Earache
C. Swelling of the mucous membranes
D. Diarrhoea
E. High blood pressure

2. Why do allergy sufferers have to avoid foods that contain allergens? Only one answer is correct here.

A. The allergens make the food indigestible
B. Allergens can affect the absorption of important nutrients
C. Even the smallest amounts of the allergens can cause severe health damage and in the worst case be fatal
D. Allergy sufferers do not have to avoid allergen-containing products, they can get used to them

3. In which EU regulation can food producers find a list of allergens that require labelling? Only one answer is correct here.

A. Regulation (EU) No 1169/2011, Annex II
B. Regulation (EU) No 1129/2011, Annex II
C. Regulation (EU) No 1129/2008, Annex III
D. Regulation (EU) No 1169/2010, Annex II
E. Regulation (EU) No 1169/2011, Annex III

4. Where can food producers find a handout on how to deal with unintentional contamination with allergens? Only one answer is correct here.

A. In Codex Alimentarius CXC 60-2020
B. In Codex Alimentarius CXC 50-2020
C. In Codex Alimentarius CXC 60-2010
D. In Codex Alimentarius CXC 80-2010
E. In Codex Alimentarius CXC 80-2020

5. What can cause unintentional contamination with allergens? Choose four correct answers.

A. Due to inadequately cleaned clothing
B. Due to inadequately cleaned transport containers
C. Due to insufficiently cleaned machines
D. Due to confusion in labelling
E. Due to poorly cleaned work surfaces

6. Which of the following ingredients must be labelled as an allergen in the list of ingredients? Choose four correct answers.

A. Soya lecithin
B. Mustard seed
C. Mussel meat
D. Whey protein
E. Chilli flakes
F. Wheat starch

7. Allergens do not have to be labelled for goods offered in bulk. Right or wrong?

A. Correct
B. Incorrect

8. In the product "egg noodles" the egg does not have to be labelled as an allergen in the list of ingredients. Right or wrong?

A. Correct
B. Incorrect

Key of correct answers

1. (A), (C), (D)
2. (C)
3. (A)
4. (E)
5. (B), (C), (D), (E)
6. (A), (B), (D), (E)
7. (B)
8. (A)

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LECTURER: prof. dr hab. Ewa Czarniecka-Skubina, Warsaw University of Life Sciences

TOPIC: Physical hazards in ecological food production

TEXT FOR VIDEO SLIDES:

Slide 1

Hello, my name is Ewa Czarniecka-Skubina. This material is prepared in the frame of SAFE-ORGfood-project co-funded by Erasmus+ Program of the European Union. In my presentation I am going to explain you what are the Physical hazards in ecological food production.

Slide 2

At the beginning I would like to introduce myself. I am a professor of Warsaw University of Life Sciences at the Institute of Human Nutrition Sciences. I am a food technologist. I have 30 years professional experience both in food industry as a specialist in food technology and as university teacher and scientist as well. My research area is focused on food production, new technologies, catering technology, food quality, food safety, human nutrition, as well as consumer behavior, especially in foodservice. I am the author and co-author of numerous scientific and popular science articles, and books, including books for example book "*Food hygiene production*", "*Guide for implementing the HACCP system in hotel gastronomy*".

Slide 3

First, I would like to explain the term physical hazards. The term hazard – is defined as a biological, chemical, or physical agent in, or condition of, food with the potential to cause an adverse health effect on the consumer (*Codex Alimentarius*). Physical contaminants are additional matter or alien objects normally not existing in food that could cause injury, disease, or psychological trauma to the organism.

Their elimination is essential to the production of safe food. It should be emphasized that among foreign bodies posing a physical threat to health safety, they represent a different level of risk, and the degree of difficulty in their elimination varies.

Slide 4

Physical (non-radioactive) contaminants can be divided in three groups. The first group is minerals such as soil, stones, dust, metals, glass, fiber, paint flakes, etc. The second group is plants such as weeds, leaves, stems, wheat ears. The third group is animals such as mites, insects, rodents, and fowl. Contaminants from these groups can appear during the harvest of raw materials, during their storage as well as during food processing.

Physical hazards in food processing could be unavoidable, that occurs in food as a byproduct for example stems in blueberries. It may also be avoidable physical hazards that are present in food due to the lack of proper GMPs, for example, glass shards.

Slide 5

The physical hazards are related to

1. agricultural crops and storage;
2. incorrect/ poor practices in agricultural foods and in material/ produce in food processing,
3. incorrect/ poor practices in the production of animal origin;
4. poor maintenance of building, facilities, and equipment;
5. poor hygienic practices of the staff.

This slide shows potential physical hazards in ecological production and their sources.

Glass pieces usually come from bottles, jars, lamps, utensils, gauge covers, and light fixtures.

Glass (or transparent plastic) is almost impossible to detect in a product and poses an extremely dangerous threat to the consumer. Therefore, the plants should pay particular attention to the elimination of potential glass sources. If possible, it should be replaced with other materials, and where it occurs, it should be properly labeled and checked regularly. Any defects or changes in the glass surfaces should be noted in the documentation.

Stones fragments may come from fields and fragments of destroyed buildings.

In turn, metal elements (nails, keys, coins, staples, machinery parts) may come from machine parts, fields, wires, farms, or from plant production workers.

Slide 6

Physical hazards can include pieces of pests and insects, as well as contamination by pests (droppings, fur, feathers, rodent hairs, dead bodies, eggs, and larvae). They usually come from fields and factory production areas. One of the ways to eliminate them is preventive actions, and when they occur, the deratization treatments, disinsection, and hygiene procedures are needed.

The source of bones is fields, improper industrial technology, and improper plant processing.

Structural elements, such as bulbs, paint, fragments of plaster, insulation materials, grease, nuts, and bolts, construction materials (buildings), can come from improper storage of raw materials, as well as final production areas.

It is important that all openings such as windows in the plant are protected against the penetration of pests (insects, rodents), i.e. covered with protective nets or protective grilles.

Slide 7

This slide shows other potential physical hazards in ecological production and their sources. This could potentially be fragments of wood coming from fields, land, chests, pallets, boxes, and buildings, fragments of cardboard, as well as pieces of plastic materials.

Among other physical hazards, we can mention dust, needles, and feathers from poultry, pieces of bone from meat, seeds, vegetable matter, dirt, stones, and rocks that come from vegetables and fruit cultivation.

Slide 8

Now, I will explain the role of farm workers and plant production workers in delivering physical hazards to ecological (organic) food production. Personnel participating in the various stages of ecological food production may cause physical hazards through careless (inappropriate) production practices.

Items such as jewelry, pens, pencils, hair, fingernails, plasters, cigarettes, and elements of clothing such as buttons can get into food during its production. For this reason, it is necessary to wear protective clothing and it is not allowed to carry any items in the upper pocket of the protective clothing. The wearing of jewelry (watches, earrings, clips, chains, wedding rings, or rings) in food production is strictly prohibited. It is also forbidden to bring glass items into the production hall. Similarly, smoking cigarettes while working with food is strictly prohibited.

Slide 9

In order to avoid physical threats in ecological food production, the most important thing is prevention such as:

- elimination of potential sources of physical hazards within the plant,
- systematic employee training programs, including personal hygiene training;
- regular inspections of equipment,
- avoiding temporary make-shift repairs,
- inspection of raw materials and control of proper food storage.

Examples of good practices in ecological food production are:

- not using wood and glass, where it is possible,
- protected: lighting tubes (a shatterproof quality), glass windows (covered with protective foil),
- control processes by using: appropriate design of equipment, metal detectors in food processing,
- using detectable disposable caps with a metal strip,
- using pens/ band-aid detectable by metal detector,
- protection against the entry of pests (insects, rodents) to production plants,
- good hygiene practice of employees,
- good sanitation,
- quality control program

Slide 10

This slide shows the health effects for consumers caused by physical hazards in ecological food. The foreign objects swallowed by potential consumers will cause minor to serious injury. Any hard or sharp object could be a physical hazard because it causes mouth or throat wounding. The possible injuries include cuts, bleedings, infections, choking, damage to the teeth or gums, trauma, and illness. Injuries sometimes require surgery to locate and remove. Mineral contaminants may often cause tooth breakage, cuts, and bleeding in the mouth, or in the oesophagus, as well as perforation of tissues of the gastrointestinal tract tissues and a subsequent need for surgical intervention. Animal and plant contamination may cause disease, allergies, poisoning, and even stronger consequences – secondary infections associated with this type of injury.

Slide 11

Let me briefly summarize your knowledge of the physical hazards during ecological food production.

Physical hazards are additional matter or alien objects normally not existing in food that cause injury, disease, or psychological trauma to the organism.

Physical (non-radioactive) contaminants include mineral, plant and animal substances, supplied to food during the harvest of raw material, during their storage, and during food processing. Glass or transparent plastic is almost impossible to detect in the product and poses an extremely dangerous threat to the consumer.

Personnel participating in the various stages of ecological food production may cause physical hazards through careless (inappropriate) production practices. Therefore, hygiene training is needed for all employees taking part in ecological food production. You should be aware of the serious health effect on food consumers of physical hazards and better prevent them.

For more information please read the project website.

Thank You for Your attention

MULTIPLE CHOICE QUESTION TEST

(Please select the correct answer (s)).

1: The physical hazards of food include:

A: antibiotics
B: jewelry
C: *Salmonella*
D: sand

2: The physical hazards in the field of production hygiene are:

A: room temperature and humidity
B: foreign bodies in food
C: cleaning agents
D: plant protection products

3: How can physical hazards in food be prevented:

A: actions to minimize the risk to an acceptable level
B: complete elimination of the hazard
C: application of a metal detector
D: all preventive actions

4: A piece of glass was found in the product. What is the type of hazard?

A: chemical
B: biological
C: physical
D: none of the mentioned

5: What processes can cause physical hazards to food?

A: the harvest of the raw material
B: raw material storage
C: technological process
D: none of the mentioned

6: The employee's protective clothing while working with food should:

A: be similar to other industries
B: have well-sewn buttons
C: be fastened with snaps or press studs
D: to have short sleeves

7: Wooden elements of the packaging, pieces of metal, strings are hazards:

A: biological
B: chemical
C: physical
D: microbiological

8: Choking, damage to the palate and broken teeth are the results of food contamination

A: chemical
B: physical
C: microbiological
D: biological

9: Can an employee unknowingly introduce a physical hazard to the food?

A: Yes
B: No
C: I do not know

10: The protective clothing was torn when handling food:

A: a tear in the clothes should be quickly stapled with a safety pin
B: a tear in the clothes should be quickly stapled with pins
C: protective clothing should be changed
D: you can continue to work in this clothing

Key of correct answers:

1: (B,D)

2: (B)

3: (B), (C), (D)

4: (C)

5: (A), (B), (C),

6: (C)

7: (C)

8: (B)

9: (A)

10: (C)

SAFE-ORGfood Project

Transnational Quality Education for Organic Food Safety

SAFE-ORGfood

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LECTURER: Prof. Renata Bažok, University of Zagreb Faculty of Agriculture

TOPIC: Pesticide use in organic farming

TEXT FOR VIDEO SLIDES:

Slide 1

Hello everybody this presentation is about pesticide use in organic farming.

Slide 2

My name is Renata Bažok and I have been working for 30 years at the University of Zagreb Faculty of Agriculture as a professor of entomology and phytopharmacy

My overall research emphasis is focused on the development of safe, effective, and economical methods of integrated pest management, and the biological interactions related to insect species and their environment as well as non-chemical methods for pest control.

Slide 3

Pesticides are often thought of as chemicals used not only in agriculture, but also in veterinary medicine, households, and industry for pest control. However, the fact is that pesticides are also substances of biological origin too. According to the definition of the EU Directive 1107/2009, pesticides are chemical or biological agents that deter, disable, kill or otherwise discourage pests. There are three main groups of pests: weeds, fungi and other microorganisms and insects (or other animals). Pesticides are marketed as products that contain at least one active ingredient that is effective against pests. The product also contains other substances. Some of them are solvents or substances used as formulation agents, and others could be synergists (they increase the effectiveness of the active ingredients) or safeners (they help protect the plants from the negative effects of the formulation).

Slide 4

Active ingredients may have the following functions: (i) protecting plants or plant products from pests/diseases, before or after harvest, (ii) influencing the life processes of plants (e.g., substances that affect their growth, excluding nutrients), (iii) preserving plant products, and/or (iv) destroying or preventing the growth of undesirable plants or plant parts.

Slide 5

Any product used for plant protection must be approved by a national body of the Member State. Prior to approval at the national level, the active ingredient undergoes intensive evaluation and peer review by member states and the European Food Safety Authority. The entire process is uniform for all member

states, so there are no differences between member states in the approval procedures. The approval process in the EU is very strict and the requirements placed on active ingredients are very high. For this reason, more and more approved plant protection products lose their approval every year and the number of newly approved plant protection products is very low (much lower than in other non-EU countries). The approval process is lengthy and very expensive. Therefore, small companies that may have some promising products are not financially able to start the process.

Slide 6

Various actors are involved in the process of development and approval of plant protection products. Each of them has its own role as it is shown on this diagram. The basic point is that each active ingredient must be investigated by certified laboratories that conduct studies on toxicology, ecotoxicology, residues in the environment, and laboratory and field tests on efficacy and phytotoxicity. The studies must be conducted according to standard procedures, and the results are required for toxicological and efficacy dossiers that must be submitted to evaluators and form the basis for the evaluation of the product.

The European Food Safety Agency (EFSA) appoints the evaluators. If evaluators give positive opinion and it is approved by member states, EFSA propose approval to the Commission.

The national bodies in each country approve the commercial products.

Slide 7

The Common Agricultural Policy (CAP) is strongly focused on reducing pesticide use in all member states. In order to achieve the goal set by the European Green Deal and Farm-to-Fork strategies to reduce pesticide use by 50% by 2030, the placing of pesticides on the market is strictly regulated and member states must submit all statistical data on pesticide use. In addition, each member state must prepare a low on the sustainable use of pesticides. The regulation on maximum residue levels of pesticides in food applies to the entire EU territory, with a strong tendency to reduce the maximum residue levels for many active substances.

Slide 8

In organic farming, pests must be actively controlled to prevent damage and not create conditions for uncontrolled growth of pest populations that can lead to greater damage in later years. There are many different methods and tools for pest control, as shown in this schematic diagram. To prevent pest outbreaks, growers must use appropriate agricultural practices that help prevent pest infestations. Organic farming is a holistic approach to production and involves the use of various practices aimed at conserving the natural enemies of pest species, which has a positive impact on biodiversity.

In addition, farmers must be able to detect pest symptoms at an early stage of development and monitor the pest population to predict future trends in the pest population. When the pest population reaches an economic threshold, there are several ways to directly control the pests. Growers must use all of these methods before deciding to use commercially available pesticides.

Slide 9

The use of pesticides is a last resort, and in the case of organic farming, only those products that are authorized under Directive 1107/2009 and have been evaluated and found to be in compliance with the

objectives and principles of organic farming may be used. The EU directive on organic farming 2021/1165 is new and Annex I of this directive lists all active substances approved in organic farming. In addition to the plant protection products registered according to 1107/2009, Annex I also lists basic substances as active ingredients that are not predominantly used as plant protection products but may be important for plant protection. The economic interest in the authorization of these substances may be limited due to the different reasons.

Slide 10

Because PPP registration is lengthy and very costly. There is serious concern that innovative and potentially lower-risk PPPs such as biopesticides (which are generally approved for use in organic agriculture) will be kept off the market by this complex, expensive, and lengthy registration process. Therefore, organizations involved in organic agriculture are advocating for a shorter and less costly approval process for such products.

Slide 11

Here is the list of references that can be further explored

Slide 12

Thank you for your attention.

MULTIPLE CHOICE QUESTION TEST

1. **Pesticide is defined as. Please chose the correct statement.**
   A. Pesticide is defined as chemical agent that deters, disables, kills or otherwise discourages pest.
   B. Pesticide is defined as chemical or biological agent that deters, disables, kills or otherwise discourages pest.
   C. Pesticide is defined as biological agent that deters, disables, kills or otherwise discourages pest.

2. **Pesticide products may contain synergists. Synergists are aimed to… Please select correct answer.**
   A. Act against pests by killing them
   B. Act against pests by disable them
   C. Increase the efficacy of active ingredient
   D. Protect plants from harmful effect of the formulation

3. **The functions of active ingredient of pesticides are not… Please select correct answer(s).**
   A. Protect plants from harmful effect of the formulation
   B. Protecting plants or plant products from pests/diseases, before or after harvest
   C. Influencing the life processes of plants (e.g. substances affecting their growth, excluding nutrients)
   D. Increase the efficacy of active ingredient
   E. Preserving plant products
   F. Destroying or preventing the growth of undesirable plants or plant parts.

4. **Registration procedure for plant protection products (PPPs) in EU involves different authorities at national and international level. Please select the authority responsible for registration of active ingredient of PPP.**
   A. Ministry of Agriculture
   B. European Food Safety Agency (EFSA)
   C. World Health Organization (WHO)
   D. Food and Agriculture Organization (FAO)

5. **The responsibilities of certified laboratories in the process of registration of PPPs are to develop formulations, investigate toxicology, ecotoxicology etc., develop the production process, develop and register the patent. True or false?**
   A. False
   B. True

6. **In organic farming to control pests…. Please select correct answer(s).**
   A. Farmers can do nothing since is not necessary
   B. Shall be approached holistically
   C. Farmers shall apply appropriate agro-technical practices that can reduce the pest population
   D. Farmers shall rely only on resistant varieties
   E. Farmers shall apply various mechanical, physical and biotechnical methods to reduce pest intensity

7. **According to EU regulation 1165/2021 for pest control in organic farming the use of substances listed in Annex I are allowed? True or false?**
    A. True
    B. False

Key of correct answers:

1: Pesticide is defined as chemical or biological agent that deters, disables, kills or otherwise discourages pest. (B)

2: Increase the efficacy of active ingredient (C)

3: Protect plants from harmful effect of the formulation (A)

Increase the efficacy of active ingredient (D)

4: European Food Safety Agency (EFSA) (B)

5: False (A)

6: Shall be approached holistically (B)

Farmers shall apply appropriate agro-technical practices that can reduce the pest population (C)

Farmers shall apply various mechanical, physical and biotechnical methods to reduce pest intensity (E)

7: True (A)

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LECTURER: Lecturer Katrin Laikoja, Estonian University of Life Sciences

TOPIC: Prerequisite programs (PRPs).

TEXT FOR VIDEO SLIDES:

Slide 1

Hello, everybody! This presentation is about Prerequisite Programs (PRPs) within Food Safety Management Systems

Slide 2

My name is Katrin Laikoja and I work at the Estonian University of Life Sciences as a lecturer of food safety management systems.

I have been working in this field for more than 20 years and I teach students of food technology, aquaculture and veterinary medicine in food safety, food hygiene, and design, implementation and maintenance of self-control systems.

Slide 3

As food business operators we are responsible for production of safe food. The objective of a Food Safety Management System, or FSMS, is to control food safety hazards in a food business and their products. FSMS consists of Prerequisite Programs (PRPs) and procedures based on the Hazard Analysis Critical Control Points (HACCP) principles. The PRPs (consisting of Good Hygiene Practices, GHP, and Good Manufacturing Practices, GMP) provide the foundation for effective HACCP implementation and should be in place before any HACCP-based procedures are established. Analysis of foodborne outbreaks has been shown, that very often these were caused not by a breakdown or failure at CCPs, but by a failure of one or more PRPs, like bad personal hygiene or poor cleaning. That is why the development, implementation and maintenance of effective PRPs is essential.

Slide 4

As I said before, the objective of a food safety management system is to **control food hazards**. Food safety team has to identify all potential food safety hazards due to raw material, personnel, processing technology or methodology, equipment and production environment. Then the team has to decide if the specific microbiological, chemical or physical hazards can be controlled by PRPs, or by operational prerequisites or by critical control points. More information about oPRPs and CCPs can be found from Commission Notice from 2016, referred on last slide.

PRPs are not specific for a given hazard, but apply generally, across the whole process.

Slide 5

PRPs are defined as the conditions and measures necessary to ensure the safety and sustainability of food at all stages of the food chain. Are there any requirements for PRPs? Yes, these are general hygiene requirements, specific hygiene requirements for food of animal origin, requirements for traceability (which is essential for organic production too), etc, what are described in different regulations (852/2004, 853/2004 and 178/2002).

Slide 6

PRPs in their details are company specific, but most typical PRPs occur in several enterprises and may be divided into 13 categories–12 described in Commission Notice 2016/C 278/01, plus one additional PRP of 'product information and customer awareness' proposed in EFSA' Opinion from 2017. This list here and on next slide is just an example and is not exhaustive. Examples of PRPs: infrastructure; cleaning and disinfection; pest control; technical maintenance and calibration; prevention of contamination from production environment; allergen management; waste management.

Slide 7

Some more examples of PRPs are: water control; all aspects related to personnel; raw materials and purchasing; temperature control of storage environment, maintenance of cold chain; working methodology; product information (labeling) and consumer awareness.

For production of organic products there may be additional PRP for segregation and traceability of organic produce, but these specific activities of organic production may be described under other PRPs as well. As mentioned before, the list is not exhaustive.

Slide 8

It may be difficult to distinguish whether a particular hazard is controlled by PRPs or by a HACCP plan, i.e by a CCP. The following table will help to understand the different essence of both, I hope. While comparing PRP and CCP, please keep in mind two typical examples: cleaning and disinfection for PRP and product heat treatment/pasteurization for CCP.

PRPs are horizontal, one PRP applies to all operations. PRPs are not specific for a given hazard, but apply generally, across the whole process: effective cleaning of facilities or equipment is important in every operation of organic food production. It doesn't matter where we are cleaning, in the reception of raw materials, in processing or in final product warehouse, cleaning has to be done everywhere; food handlers have to know and follow hygienic practices in every production stage, etc. For comparison, CCP is not cross-process, but applies to a specific hazard. In our example specific microbiological hazard is pathogens in raw organic apple juice, which is controlled by specific operation of pasteurization in specific equipment.

Good cleaning may contribute to the reduction of pathogens in food, but pasteurization ensures control of pathogens and other microbiota in juice.

If something goes wrong in PRP, cleaning wasn't done properly, it doesn't mean the product is unsafe. The failure in CCP (incorrect temperature and/or holding time) indicates that the product is unsafe.

Essential feature of a CCP is that it is measurable in real time and it has critical limits, like pasteurization at 72 °C for 20 seconds. Measuring of effectiveness of cleaning is usually not measurable in real time, especially if we carry out microbiological testing for cleaned surfaces.

So, PRPs may prevent a food safety hazard from occurring; a HACCP system will implement CCPs, capable of controlling a food safety hazard that has been determined to be reasonably likely to occur.

Slide 9

After making decisions on which PRPs control the hazards, the team has to develop and implement effective PRPs. You can follow a simple scheme for writing a procedure for specific PRP. Please describe: What should be done? How should it be done? Who should do it? How should it be monitored? What corrective actions are needed if the requirements are not met?

In order to implement the PRP, the content of the procedure must be well communicated to personnel. Sometimes a training is needed for carrying out specific activities within the PRP.

Always keep the PRP procedures updated, otherwise the foundation of FSMS may collapse.

Depending on the particular procedure, the effectiveness of some processes must be demonstrated periodically, e.g cleaning of food contact surfaces was carried out effectively or personnel is following hygiene rules.

Slide 10

Effective PRPs need to be well managed, carried out as planned and sometimes monitored too. This can be achieved by working out a multi-layered documentation.

General procedure describes how the PRP is managed and what are the expectations to this particular PRP. For some PRPs, detailed work instructions are needed: step-by-step procedures on how each task is accomplished, how monitoring is ensured and what corrective actions must be taken. As PRPs are our effort for ensuring food safety, we have to be ready to verify our activities for the prevention or reduction the hazards to safe levels. So, we need to prepare document forms to be used in the monitoring process. After filling in the blanks with relevant data, we have records which prove our actions.

Slide 11

Let me briefly summarize about PRPs.

Prerequisite programs (PRPs) are conditions and measures necessary to ensure food safety.

PRPs have to be documented, updated whenever there are changes associated with these and reassessed, at least annually.

PRPs have to reflect our current production environment and practices within our company.

If the PRPs are not functioning effectively, the introduction of HACCP will be complicated, resulting in a burdensome, over-documented system.

As organic producers we also have to comply with specific commodity policies, manuals, procedures and associated regulations.

Slide 12

And some references

Slide 13

Thank you for your attention.

Please also check other study materials on the SAFE-ORGfood project web page.

MULTI CHOICE QUESTION TEST

1. **The general goal of Food Safety Management System is to**
   A. Increase the profit of the company
   B. Produce high quality and healthy food to consumers
   C. Produce safe food and protect the public against food related hazards
   D. Create documentation for official controls

2. **In food safety management GHP is an abbreviation from**
   A. Good Hygiene Practices
   B. Great Healing Properties
   C. Global Health Program
   D. General Hygiene Program

3. **Examples of PRPs are:**
   A. Pest Control
   B. Prevention of cross-contamination
   C. Personnel's training and personal hygiene
   D. Temperature management in cold storage rooms

4. **What statements are INCORRECT for PRPs?**
   A. PRPs are day-to-day practices applicable across the production, to all operations
   B. PRPs are the foundation of the HACCP plan
   C. PRPs are specific to a product
   D. If PRP fails, the product always will be unsafe

5. **In food safety management GMP is an abbreviation from**
   A. General Motors Poland
   B. Guaranteed Maximum Price
   C. Good Manufacturing Practices
   D. Good Modern Premises

6. **What statements are CORRECT for PRPs**
   A. Monitoring and documentation are not needed for PRPs
   B. PRPs have to reflect production environment and practices within specific company
   C. PRPs are conditions and measures necessary to ensure food safety
   D. PRPs are not needed in organic processing of organic raw materials

7. **All food business operators have to have the same number and same type of PRPs. This statement is**
   A. Right
   B. Wrong

Key of correct answers:

1: C, 2: A, 3: A, B, C, D, 4: C, D, 5: C, 6: B, C, 7: B

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LECTURER: prof. WULS Joanna Trafiałek, Warsaw University of Life Sciences

TOPIC: HACCP (hazard analysis and critical control points)

TEXT FOR VIDEO SLIDES:

Slide 1

Hello everybody. This presentation is about hazard analysis and critical control points principles, in short words: HACCP principles.

Slide 2

My name is Joanna Trafiałek. I am a professor at the Warsaw University of Life Sciences. I have over 25 years of professional experience as food technologist, university lecturer and auditor. I teach food hygiene and food safety, including HACCP principles. Food safety and systems for ensuring food safety are my main scientific areas of interest.

Slide 3

Food safety procedures are mandatory in many countries, including European Union countries, for all food business operators. They have to develop, implement and maintain HACCP-based procedures to ensure food safety. HACCP is an acronym for Hazard Analysis and Critical Control Points.

Please keep in mind that before the implementation of HACCP procedures, Prerequisite programs should be well-established, fully operational, and verified.

There are 7 HACCP principles: 1) hazard analysis; (2) determining critical control points (in short words CCPs); (3) establishing critical limits at CCPs; (4) establishing and implementing effective monitoring procedures at CCPs; (5) establishing corrective actions when monitoring indicates that a CCP is not under control; (6) establishing verification procedures; (7) establishing documents and records.

Today I am going to tell you about principles referring to critical control points. That will be principles no. 2, 3, 4, and 5. You will learn how to determine critical control points, what are critical limits, and how to establish a system to monitor CCPs and corrective actions taken when a deviation occurs.

Slide 4

Principle no. 2 refers to determining of CCPs. CCPs are important for ensuring food safety. You should remember that more than one CCP can be identified. However, on the other hand, in certain organic food businesses, it is not possible to identify CCPs at all. In such situation HACCP-based documentation should be developed without CCP procedures.

The question is how to decide which step in the production diagram should be identified as a CCP? You can apply several methods for CCPs determining, e.g. a decision tree, expert consultations, and using

the HACCP team's experience. The choice depends on the HACCP team. The determining of CCPs has to be documented. A good solution is summing up the CCPs identification in a table format where all information will be given. You can develop a special table where all issues essential to the CCPs determining can be recorded. In the next slide, I am going to explain the content of such a table.

Slide 5

Examples of CCPs in organic production could be the reception of milk, pasteurization, flour sieving, baking, cold storage, smoking.

The table shows two CCPs, such as meat vegetables broth boiling and pasteurization. The names of CCPs have to be given in the first column.

In the second column, you should list the hazards that have to be controlled in the specific CCP. You can use abbreviation of the previously listed hazards, e.g., at the stage of pasteurization, "B" means "biological hazards" and "C" is "chemical hazards".

Your decision on whether the step needs to be identified as CCP has to be written in column no. 3. In the next column, you should provide the justification of your decision and the decision-making method. In the presented case three methods were used i.e., testing of product samples, expert consultation, and decision tree. In the last, fifth column, the answers for each of four decision tree questions shall be recorded.

Slide 6

This slide shows the principle no. 3, i.e. establishing of critical limits. Meeting the critical limits is a guarantee of organic food safety.

Critical limits should be established for each CCP. Critical limits correspond to the maximum values of certain parameter or parameters, acceptable with regard to product safety. The establishment of critical limits should be based on experience, best practice, internationally accepted standards, scientific publications, EU legislation, European Food Safety Authority (EFSA) opinions.

Critical limits should be validated. Parameters for which critical limits are being set can be measured or observed. Examples of measured parameters include temperature, time, pH, moisture content, amount of additive, preservative or salt, and observed parameters are visual appearance or texture, change of physical properties of food during processing etc.

Slide 7

Principle no. 4 refers to monitoring of the critical limits at each CCP. Let's start with the explanation of the word "monitoring". In simple words, "monitoring" means control or checking, and its aim is to ensure compliance with specified critical limits.

The control of CCPs should be the scheduled measurement or observation at a CCP in relation to its critical limits. Therefore, the HACCP team has to plan the method and frequency of monitoring. Where possible, monitoring should be continuous. It can be the control of measurable critical limits such as processing time and temperature. In contrast, other measurable critical limits such as preservative concentration cannot be monitored continuously. In such situations, periodic control should be applied.

It is recommended to design documentation of the monitoring procedures. They should describe the methods, frequency of observations or measurements, and the recording procedure for monitoring results. In the next slide, I am going to present a simple way of monitoring establishment.

Slide 8

Here, a few words of introduction are needed. It is possible to combine the documentation of several HACCP principles in one document. Such a solution is presented in the table you see. The slide shows information about HACCP principles no. 3 and 4. In the first two columns we write the names of CCPs and the kind of hazards. Then, the third column contains the parameters and their values referring to principle no. 3 establishing critical limits. The next column, column no. 4 refers to principle no. 4 i.e. monitoring system. The column is divided into four parts referring to essential information about the monitoring system. The columns mean: „what" i.e., what should be measured or observed (e.g. time and temperature), „how" i.e., how the parameter should be measured or observed (e.g. manual temperature and time measurement with a thermocouple and timer), next „when", i.e. the frequency of the measurement or observation, and „who" i.e. who is responsible for monitoring activities.

The last column no. 5 corresponds to the record of the performed activities. Therefore, in the last column the name of the form for monitoring of CCPs should be given.

Slide 9

Principle no. 5 refers to corrective action. Corrective action is any action taken when a deviation occurs, in order to re-establish control, segregate and determine the disposition of the affected product if any, and prevent or minimize the reoccurrence of the deviation.

Specific plan of the corrective actions should be developed for each CCP in the HACCP Plan, in order to effectively respond to deviations when they occur. The corrective actions plan should be developed in advance, at the time of HACCP Plan development. Various corrective actions can be planned, e.g. reprocessing, diverting of product to another use, repair of the device, retraining, replacement of the device with a new or functional one.

A periodic review of corrective actions should be undertaken to identify trends and to ensure corrective actions are effective.

Slide 10

Now, I am going to explain how to design the documentation of corrective actions. I present the table that is already known to you. You know columns no. 1, 2, 3, and 4. And now, I am going to modify a little bit the last columns. I added the fifth column for establishing the corrective actions. In addition, I changed the name of column no. 6 in such a way that it contains both records for the monitoring and for the corrective actions.

The developed table is the summary of a few HACCP principles together. It sums up principles no. 3, 4, and 5 and is a good source of information for the development of HACCP-based procedures. From the practical point of view, two procedures are needed i.e., monitoring of critical limits at each CCP and corrective actions taken when a deviation occurs.

Slide 11

Let me briefly summarize your knowledge about HACCP principles. HACCP is a system for ensuring food safety, and it consists of 7 HACCP principles. In this system, CCPs play a special role for organic food safety. CCPs are determined based on hazard analysis. HACCP team has to establish critical limits for each CCP which should be monitored. In case the monitoring system reveals that critical limits are out of control, corrective actions have to be undertaken.

Please remember that all HACCP principles should be documented in a HACCP Plan. The HACCP Plan is a set of documents, prepared in accordance with the HACCP principles to control of significant hazards. In the frame of our project, we developed HACCP Plans for selected organic products, e.g., traditional Polish bigos. You can download the developed HACCP Plans and all other project results from the project website.

Slide 13

Thank you for your attention.

To find out more visit the project website.

MULTIPLE CHOICE QUESTION TEST

1. **How many HACCP principles there are? Please select one correct answer.**
   A. 5
   B. 7
   C. 6
   D. 12

2. **What are the methods for determining critical control points? Please select all correct answers.**
   A. A decision tree
   B. Expert consultations
   C. The method based on the HACCP team's experience
   D. Any method chosen by the HACCP team

3. **Critical limits have to be established for….. Please select one correct answer.**
   A. The most important critical control points
   B. Each critical control point
   C. Each step at flow diagram
   D. Each biological hazard

4. **How many parameters can be established as critical limits? Please select all correct answers.**
   A. A set of parameters e.g., 2, 3 or more
   B. One parameter
   C. No parameters are necessary
   D. It depends on the process and HACCP team's decision

5. **Critical limits correspond to the maximum/minimum values acceptable with regard to product safety. True or false?**
   A. False
   B. True

6. **Which answer explains the meaning of the monitoring of CCPs. Please select one correct answer.**
   A. The scheduled measurement or observation at a CCP relative to its critical limits
   B. Only the scheduled measurement at a CCP relative to its critical limits
   C. Only the scheduled observation at a CCP relative to its critical limits
   D. The scheduled process of hygiene control

7. **The CCP monitoring procedure should include the below listed issues. Please select one correct answer.**
   A. Only the methods of observations or measurements of critical limits
   B. Only the frequency of observations or measurements
   C. The methods and the frequency of observations or measurements
   D. The methods, the frequency of observations or measurements, and the recording procedure for monitoring results

8. **If the deviation from the values of critical limits occurs, it is necessary to take specific actions named as…… Please select one correct answer.**
   A. Preventative actions
   B. Corrective actions
   C. Risk assessment
   D. Cleaning and disinfection

9. **Good examples of corrective actions are listed below. Please select all correct answers.**
   A. reprocessing, diverting of product to another use, establishing of the right parameters of heat treatment, development of operational instructions
   B. repair of the device, replacement of the device with a new/functional one
   C. diverting of product to another use, reprocessing, retraining
   D. diverting of product to another use, repair of the device, training, periodic technical review of the device, surface disinfection

10. **All HACCP principles have to be documented in HACCP Plan. True or false?**
    A. False
    B. True

11. **A HACCP Plan is ….. Please select all correct answers.**
    A. One document/one procedure to ensure control of significant hazards
    B. A set of documents, prepared in accordance with HACCP principles to ensure control of significant hazards
    C. Not mandatory for organic processors
    D. Mandatory for all food business operators in European Union, including organic processors

12. **Where HACCP principles have to be implemented? Please select all correct answers.**
    A. In the food plant producing organic meat products
    B. In the plant producing organic fruit and vegetable products
    C. In the plant producing organic milk and dairy products
    D. In the organic bakery, at oil producer

Key of correct answers:

1: (B)

2: (A), (B), (C), (D)

3: (B)

4: (A), (B), (D)

5: (B)

6: (A)

7: (D)

8: (B)

9: (B), (C)

10: (B)

11: (B), (D)

12: (A), (B), (C), (D)

SAFE-ORGfood Project

Transnational Quality Education for Organic Food Safety

SAFE-ORGfood

Project No. 2020-1-PL01-KA203-081809

O4 - E-learning materials on organic food safety

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TOPIC: EU Regulation, Reg. (UE) 2018/848

TEXT FOR VIDEO SLIDES:

Slide 1

Hello everybody. This presentation is about Eu Regulations concerning organic agriculture.

Slide 2

My name is Verdiana Petroselli. I work together with Roberto Mancinelli at the Department of Agricultural and Forestry Sciences - University of Tuscia.
Our research group has been dealing with aspects related to the sustainability of agri-food production, with an agro-ecological approach for over 20 years. Our studies have been and are mainly concerned with the production phase of agri-food products.

Slide 3

Organic food production and processing in the EU follow the rules set in the Regulation (EU) 2018/848 of the European Parliament and of the Council of 30 May 2018 on organic production and labeling of organic products. This Regulation repeals Council Regulation (EC) No 834/2007, and Commission Implementing Regulation (EU) 2021/1165 laying down certain rules for the application of Regulation (EU) 2018/848 as regards the documents required for the retroactive recognition of periods for the purpose of conversion, the production of organic products and information to be provided by the Member States.

The slide shows how there has been an enrichment of regulations. The current Reg. 848 raises objectives (Environment/Short supply chain), hinges technical practice on legal elements, evolves the scope and refines the tools (Maturity of risk analysis, Reflections on additives/flavors and sanitizers).

Slide 4

The current regulation applies to all stages of the food chain, from farm to plate, including primary production, preparation, storage, processing, transport, distribution, and supply to consumers.

These regulations, covering all areas of organic production, are based on principles such as, among others, the prohibition of the use of GMOs, the prohibition of the use of ionizing radiation, all chemical products such as fertilizers, herbicides, pesticides, hormones, synthetic food additives, and the restriction of the use of antibiotics only when necessary for animal health. This means that organic producers must adopt several alternative approaches to maintain soil fertility, and animal and plant health, and ensure the quality, safety, and expected shelf life of processed organic food.

Slide 5

Based on the content of ingredients of agricultural origin, the following food categories can be certified and labeled: 1) organic food; 2) food with organic ingredients; 3) food with organic ingredients from hunting and fishing products; 4) plant foods “in conversion to organic farming”.

For a product to be certified as 'organic food' it must meet the following requirements: 1. the organic ingredients of the product must represent at least 95% by weight of the total ingredients of agricultural origin; 2. non-organic ingredients of the product must be permitted by ANNEX V of EC Reg. (EU) 2021/1165.

(For food with organic ingredients, ingredients of organic agricultural origin may be less than 95% by weight of the total of the ingredients of agricultural origin; and the non-organic ingredients of agricultural origin in the food are not limited to those permitted by ANNEX V of EC Reg. (EU) 2021/1165.

In foods with organic ingredients from hunting and fishing the main ingredient of the product is non-organic and comes from the hunting or fishing of wild animals while all other ingredients of agricultural origin in the product are organic.

And finally, a plant food is defined as being 'in conversion to organic' when 'a plant food contains only one ingredient of agricultural origin that has undergone a conversion period of at least 12 months prior to harvest.)

Slide 6

Throughout the farm-to-fork chain, all substances used in the various processes must be present in the Annexes provided for in the Regulation. One of the objectives of organic production and processing is to reduce the use of external inputs. Therefore, any substance used in organic farming, e.g. to fight pests and diseases, must be approved by the European Commission. Specific rules also apply to the approval of inputs such as fertilizers and food additives.

Slide 7

Furthermore, following organic principles, processed organic food should be produced mainly from agricultural ingredients. Only added water and salt are not considered in this restriction. Specific preparations of microorganisms and enzymes as well as minerals, vitamins, flavourings, amino acids, micronutrients may be added to food for certain nutritional purposes, but only if they are authorized according to organic regulations. Non-organic agricultural ingredients may only be used after authorization by the nation.

To ensure the highest standards of quality and safety of organic food products, certified products can only be sold if they are packaged. Non-packaged products can only be sold if the shop is also certified according to Reg. (EU) 2018/848.

Slide 8

Thank you for your attention.

MULTIPLE CHOICE QUESTION TEST

1. **Organic food production and processing in the EU follow the rules set in the Regulation (EU):**
   A. 834
   B. 848
   C. 2092

2. **To which stages of the supply chain does the current Regulation apply?**
   A. Only some stages of the food chain such as: primary production and distribution.
   B. Only some stages of the food chain such as: preparation, processing and distribution.
   C. All stages of the food chain, from farm to plate, including primary production, preparation, storage, processing, transport, distribution, and supply to consumers.

3. **On what principles is the current Regulation based?**
   A. Ban on the use of GMOs and the ban on the use of ionizing radiation.
   B. Ban on the use of GMOs, ban on the use of ionizing radiation, all chemical substances, hormones, synthetic food additives, and limiting the use of antibiotics only when necessary for animal health.
   C. Ban on the use of GMOs, ban on the use of ionizing radiation, all chemical substances, synthetic food additives, and limiting the use of hormones only when necessary for animal health.

4. **For a product to be certified as 'organic food' it must meet the following requirements:**
   A. 1. the organic ingredients of the product must represent at least 95% by weight of the total ingredients of agricultural origin; 2. non-organic ingredients of the product must be permitted by ANNEX V of EC Reg. (EU) 2021/1165.
   B. 1. the organic ingredients of the product must represent at least 85% by weight of the total ingredients of agricultural origin; 2. non-organic ingredients of the product must be permitted by ANNEX V of EC (EU) 2010/2080.
   C. 1. the organic ingredients of the product must represent at least 98% by weight of the total ingredients of agricultural origin; 2. non-organic ingredients of the product must be permitted by ANNEX V of EC (EU) 2010/2080.

5. **One of the objectives of organic production and processing is to increase the use of external inputs?**
   A. False
   B. True

6. **Which answers are correct?**
   A. Only added water and salt are not considered in the restriction.
   B. Specific preparations of microorganisms and enzymes, as well as minerals, vitamins, flavourings, amino acids and micronutrients may be added to food for certain nutritional purposes, but only if authorized according to organic Regulations.
   C. Specific preparations of microorganisms and enzymes, as well as minerals, vitamins, flavourings, amino acids and micronutrients may not be added to food for nutritional purposes.

7. **To ensure the highest standards of quality and safety of organic food products, certified products can:**
    A. … only be sold in organic shops.
    B. …only be sold in bulk.
    C. …only be sold if they are packaged.

Key of correct answers:

1: (B)

2: (C)

3: (B)

4: (A)

5: (A)

6: (A), (B)

7: (C)