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| **STUDY PROGRAMME:** | **Professional Undergraduate Study Programme *Agriculture***  Specific field of study: Zootechnics | |
| **Course:** | **QUALITY AND SAFETY OF ANIMAL PRODUCTS** | |
| **Course code:** 273310  **Course status**: compulsory | **Semester: V** | **ECTS credits: 6** |
| **Course holder:** | **Damir Alagić,** Ph. D., professor of professional studies | |
| **Course associates:** | **Tatjana Tušek**, Ph. D., professor of professional studies  **Goran Mikec**, M.Eng.Agr., assistant | |
| **Modes of delivery:** | **Number of hours** | |
| Lectures | 45 | |
| Excersises, | 24 | |
| Seminars | 6 | |
| Practical training | 15 | |

**Course objectives:** To prepare students to be able to independently and critically assess the validity of technological processes in the meat processing industry and to review the possibilities of various microbiological hazards for animals and humans that can be encountered in these types of production.

**Course content**

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|  |  | **Modes of delivery:** | **Places of delivery** |
|  | **Course units** | **L, E, S, PT** |
|  | ***The importance of monitoring the traffic in livestock and meat products*** - control of animals before slaughter until the final product and distribution to the market according to valid legal norms. | 2 L | Classroom |
|  | ***Chemical composition of meat*** - determination of the chemical composition of the meat and factors affecting it (breed, sex, age, anatomical position on the carcass, etc.). | 4 L | Classroom |
|  | ***Procedures before slaughtering animals*** - animal identification, health check, mandatory rest before slaughter, stunning, safety in the slaughterhouse. | 4 L | Classroom |
|  | ***Slaughter lines (cattle, pigs, poultry)*** - slaughter mass and dressing percentage - the specifics of the technological process depending on the type of animal, the usability of the carcass and edible offal. Slaughter line for horses and small ruminants. | 5 L | Classroom |
|  | ***Veterinary sanitary supervision*** - assessment of carcasses and offal for human consumption without restrictions, mandatory sampling for trichinosis and BSE, bacterial poisoning of animal products. | 5 L | Classroom |
|  | ***Postmortem changes and ripening of meat*** - enzymatic activity according to individual chemical components (rigor mortis, glycolysis, proteolysis, lipolysis). | 3 L | Classroom |
|  | ***Categorization and cutting of meat*** - industrial and commercial method in accordance with legal norms, meat preparation in a controlled atmosphere. | 4 L | Classroom |
|  | ***Colloquium I.*** | 1 L | Classroom |
|  | ***Meat preservation*** - cooling, freezing, salting and brining, dehydration, heat treatment - application and methods of implementation in accordance with legal norms, the possibility of combining conservation methods; sustainability and storage conditions, guarantee of the absence of microorganisms. | 6 L | Classroom |
|  | ***Meat processing*** - categorization of products with specific characteristics and conditions that must be met. | 7 L | Classroom |
|  | ***Quality of animal products*** - chemical and physical analysis: determining the presence of foreign bodies and heavy metals - residues. | 2 L | Classroom |
|  | ***Slaughter by-products*** - blood, skin, horny parts, inedible offal and their disposal. | 2 E | Classroom |
|  | ***Technological production procedures*** - the possibilities of combining the basic raw material and added ingredients, the importance of the continuity of the technological process and preventing the crossing of raw material paths. | 2 E | Classroom |
|  | ***Additives and spices*** - the concept of additives, legal regulations related to types and quantities, the role they play in certain types of processed products. Additives not allowed by law (safety of animal products). | 2 E | Classroom |
|  | ***Colloquium II.*** | 1 L | Classroom |
| 16. | ***Packaging*** - types of packaging materials (covers - natural and artificial, cans, foils), the role of primary materials and what conditions they must meet. New technologies in the packaging of animal products (food safety). | 2 E | Classroom |
| 17. | ***Assessment of the quality of meat and meat products*** - sensory, bacteriological and chemical, examination: - who performs the quality assessment and based on which parameters, how are the assessment results interpreted, records that must be kept, applicable legal norms. Animal product declaration - mandatory highlighting of the content and safety of animal products on the content of allergenic and goitrogenic substances. | 5 E | Practicum |
| 18. | ***Determination of water content in meat.*** | 2 E | Laboratory |
| 19. | ***Plant sanitation*** - disinfection, disinsection and pest control measures; HACCP system, utilization institute. | 2 E | Classroom,  Utilization institute |
| 20. | ***Fish, poultry, game and eggs on the market*** - specifics with regard to legal norms; canning eggs. | 2 E | Classroom |
| 21. | ***Positive legal regulations in the trade of meat products*** - length and conditions of storage, compliance with microbiological standards; Food Agency; Quick notification system. | 1 E | Classroom |
| 22. | ***Field exercises, course unit topics no. 4 and 5*** | 4 E | Field trips |
| 23. | ***Colloquium III.*** | 1 L | Classroom |
| 24. | ***Topic of seminar I.*** | 2 S | Classroom |
| 25. | ***Topic of seminar II.*** | 2 S | Classroom |
| 26. | ***Topic of seminar III.*** | 2 S | Classroom |
| 27. | ***Practical training***  The participation of students in performing simpler jobs and tasks in the stables of the University Practice facilities, related to the field of zootechnical procedures and meeting the welfare of animals, which are determined by the teacher. | 15 PT | Practicum |
| **In total** | | **45+24+6+15**  **(L+E+S+PT)** |  |

**L=Lectures, E=Excersises, S=Seminars, PT=Practical training**

**Learning outcomes (LO)**

LO 1. Present the importance of animal production and connect it with the specifics of the production of animal products.

LO 2 Assess the importance of proper meat categorization and meat preservation.

LO 3 Connect proper meat processing with the quality and safety of the animal product.

LO 4. Justify the importance of proper handling of by-products in the slaughterhouse and outside it.

LO 5. Connect the sustainability of animal products with the importance of the correct application of various additives and the appropriate way of packaging.

LO 6. Assess the importance of implementing sanitation measures in the processing of meat from domestic animals, fish and game.

Course holder:

Damir Alagić, Ph. D., professor of professional studies

Križevci, July 2024