UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN

Faculty of Animal Bioengineering

Course title: Principles of DNA diagnostics in livestock

ECTS credit allocation (and other scores): 3

Semester: spring

Level of study: ISCED-7 - second-cycle programmes (EQF-7)

Branch of science: Agricultural sciences

Language: English

Number of hours per semester: 30

Course coordinator/ Department and e-mail: prof. Stanislaw Kaminski/Department of Animal Genetics; stanislaw.kaminski@uwm.edu.pl

Type of classes: classes and lectures

Substantive content

CLASSES: Sources of DNA obtained for genetic testing. Isolation of genomic DNA - assessment of its quantity and quality. Agarose gel DNA electrophoresis and electrophoregram analysis. Examination of the structure of selected genes in terms of their mutations detection. Principle of polymerase chain reaction (PCR). Rules for the preparation of reagents and mixtures for carrying out PCR reactions. Stages of the PCR-RFLP diagnostic test on example of the kappa-casein gene (CASK) in cattle and RYRI in pigs. Activation of students in the field of investigating the molecular causes of disorders livestock growth and development.

LECTURES: Transfer of knowledge about the molecular basis of quantitative and qualitative characteristics. Showing sources of variation genetic encoded in the nucleotide sequence. Demonstration of a link between point mutation and phenotypic effect. Basic discoveries of molecular genetics. The evolution of views on the structure and function of the gene Elements of expression and regulating gene expression. Classification and significance of mutations. Obligatory genetic testing in animals farm. The use of DNA markers in animal origin control. The concept of transgeneses and scheme for obtaining cloned animals.

Learning purpose: Acquiring the ability to perform and interpret a DNA test for a single mutation causative character.

On completion of the study programme the graduate will gain:

Knowledge: Explains genetic determinants of phenotypic variability of significant performance traits in farm animals.

Skills: Interprets basic mechanisms of inheritance of traits at the molecular and individual levels.

Social Competencies: Is able to work independently and in a team performing the assigned tasks.

Basic literature: Kumar V. Fundamental of animal genetics.

Supplementary literature: Watson J., Berry A., The secret of life.

The allocated number of ECTS points consists of:

Contact hours with an academic teacher: 42

Student's independent work: 52