Knowledge support to improve quality and supply of native animal products

Principal investigator: Ing. Peter Polák, PhD.

Project objectives:

- to use the ultrasound method for prediction of quality of lean meat content in farm animals
- to detect content of intramuscular fat in musculus thoracis et lumborum, recommend methods for its increase
- to test associations of selected genetic markers with growth and slaughter properties and with meat quality characteristics
- to use new alternative methods in surgical castration of entire males (immunocastration of piglets, alternative fattening of entire males to different slaughter weight)
- to determine the economic efficiency of fattening in immunocastrated pigs and entire males
- to analyse the population of the Slovak Dairy sheep, to determine selection criteria for selection of breeding animals
- to study possibilities of covariance components estimates to make the genetic evaluation of sheep more precise
- to make a detailed analysis of production and economic parameters in cattle and sheep breeding
- to define basic determinants of economic efficiency and competitiveness in breeding and to propose recommendations to improve economic efficiency in cattle and sheep breeding
- to assess production minima in dairy cows and dairy sheep breeding to achieve zero profitability without subsidies
- to analyse economic and marketing preconditions of sale to end consumer, to conduct a survey of consumer’s preferences

Optimization of nutrition and technological systems for effective and ecological animal husbandry

Principal investigator: Assoc.Prof.Ing. Jan Brouček

Objectives of the project:

- to obtain objective data about the influence of processing technologies on changes in feeds quality
- to broaden knowledge in the sphere of appendix colonization by microorganisms after the application of tested additives
- to study the influence of probiotic preparations and natural effective matters used in feed rations for animals on nutrition, microbiological, biochemical and immunological parameters of rabbits
- to study the influence of different hybrids and phenological harvest stage as well as the efficiency of various silage additives on the fermentation process and resulting quality and energy value of the produced maize silage and conserved maize grain
- to study the mechanism of polyunsaturated fatty acids and probiotic microorganisms effect on pathogenous bacteria in digestive tract of young pigs
- to evaluate the utilization of probiotics and hydrolysate from brown sea weeds for evaluation of growth and decrease of diarrhea occurrence in calves
- to analyse possibilities to increase the content of salubrious fatty acids in fat of raw cow's milk by means of intentional breeding methods
- to acquire new knowledge of causal factors influencing increase of unsaturated fatty acids content (mainly essential ones) in milk fat of dairy cows under farm conditions in relation to the gene pool (Slovak Pinzgau, Holstein, Slovak Pied breeds, and the influence of dairy cow fathers in these breeds), production conditions of nutrition (grazing, winter period, all-year complete feed ration, bio-herds of dairy cows), lactation stage, and the level of milk efficiency
- to propose intentional interventions into breeding practices to improve fatty acid compositions, namely functionality and health effectiveness of milk fat and milk foodstuffs in a natural way

- to provide a way of effective artificial nutrition of the young of cloven-hoofed game on farms
- to propose composition of complete ensilaged feed mixture for red deer
- to evaluate the machine milking process and its relation to the rate and complexity of milking out
- to determine parameters of milkability and milk composition in ewes in relation to the system of lamb rearing (ewes only milked, sucked and milked, and sucked only) in the period till lamb weaning
- to detect the influence of milk ejection reflex occurrence before attachment of milking cluster to the udder on milkability parameters and milk composition
- to determine the volume of alveolar and cistern milk in udder of ewes
- to detect the reaction of ewes on machine milking immediately after weaning of lambs and on changes in conditions of machine milking
- to characterize the reaction of ewes caused by the change of milking equipment and milking parlour
- to determine the influence of stress (social isolation and presence of man at the head of ewe during milking) on milkability parameters in ewes
- to evaluate the occurrence of lameness in ewes and possible relation of this disorder to milkability parameters and mammary gland health
- to observe the influence of environment factors on hygienic quality of produced milk and on the occurrence of production disorders in dairy cows by means of electronic sensors build in the milking robot
- to evaluate the influence of selected factors of outer and inner environment on dairy cows kept in loose housing and milked in the system of automated milking
- to evaluate maternal behaviour of the “Slovak Dairy sheep” and to study the influence of lamb-ewes raising during the period of milk nutrition on manifestation of their maternal behaviour at first lambing in this breed
- to evaluate heat comfort and comfort of housing environment in pigs during different seasons of the year aimed at the category of sucklers and weanlings using contactless infrared technique

- to study the possibilities of raising the selected sucklers from individual litters by means of feeding equipment for milk (artificial sow), and to propose the technique of artificial raising of sucklers
- to evaluate the influence of selected factors of outer and inner environment on dairy cows during adaptation to the changed housing and milking
- to evaluate the influence of selected factors of outer and inner environment on motion behaviour in cattle kept on pasture
- to observe the influence of different fibre and nitrogen levels in diets on digestion processes, interaction at protein resorption and their impacts on environment
- to evaluate the influence of additive (zeolite mineral klinoptilolit) added to the complete feed mixture (CFM) on concentrations and emissions of ammonia and greenhouse gases from pig fattening with solid floor and slatted dunging place
- to clarify the dependence of ammonia production and greenhouse gases from the type of production hybrid (Ross, Cocc), season of the year and age of chickens and litter
- to evaluate the concentrations of harmful gases (NH_4, CH_4, N_2O, CO_2, H_2O), which affect dairy cows and subsequently compare the influence of microclimate factors (temperature, relative humidity and speed of air flow) on their values
- to elaborate a composting method of waste from slaughter house for pigs (blood, digestive tract and bristles)

Research methods to keep biodiversity

Principal investigator: Prof. Ing. Peter Chrenek, DSc.

Objectives:
- to apply alternative methods of oocytes and embryo recovery from farm animals using plant preparations
- cryoconservation of embryos from selected cattle and rabbit breeds
- DNA isolation from selected animals and molecular-genetic analysis aimed at paternity verification
- to stabilize numbers of bee colonies to keep biodiversity in the country

- to minimize therapeutic intervention of varroasis therapeutics by reliable monitoring of varroasis development, by preferring medicaments on natural basis and utilization of regularities of biological suppression
- to increase health resistance of bee colonies by selection of recognized bee lines of Slovak ecotype with imported Carniolan bee from Slovenia
- to decrease the risk of toxicoses in bees at chemical protection of plants by tests of selected pesticides; to keep health sustaining quality of bee products
- to determine biological activity in pollen loads of basic honey flow resources on the basis of ovarian cell functions *in vitro*
- genetic stabilization of original meat lines in rabbit breeds (P91, M91, Nitra or Zobor breeds) selected in APRC Nitra with emphasis on preservation of animal genetic resources
- to use Japanese quail in production of functional alimentary raw materials; stabilization of genetically defined lines of animals suitable for further utilization in biological experiments
- to propose and create a functional system of ecologization measures to keep and improve biodiversity in agrarian landscape under the conditions of intensive plant production; to check the influence of these measures on population dynamics in small field animals