Creation, maintenance and monitoring of genetic animal resources in the Slovak Republic with regard of native breeds

Leader of research team: Ing. Peter Polák, PhD.

Objectives of the project:

- monitoring of animal genetic resources in farm animals according to their breed and species composition in cooperation with certified breeders' and commissioned breeding organizations
- operation of national server of animal genetic resources
- up-dating of animal genetic resource data bases, synchronisation with the international data base
- communication with breeders' associations and special-interest groups to up-date the information system
- implementation of the programme to keep the gene reserve of Oravka and Rhode Island hen breeds, Nitra rabbit, Valachian sheep breed and Japanese quail in APRC Nitra
- observation of production and reproduction parameters in gene reserve of Oravka and Rhode Island hen breeds, Nitra rabbit, Valachian sheep breed and Japanese quail
- continuation in programme of reintroduction of Oravka hen breed into the original breeding region
- elaboration of method to stabilize Zobor rabbit breed
- participation in regional animal exhibitions, selection of suitable animals to complete the gene reserves of hens and rabbits
- cooperation with gene reserve breeders
- methodical guidance of gene reserve herds (Valachian sheep; Slovak Pinzgau cattle; Nitra rabbit; Oravka, Hampshire, Sussex, Rhode Island hen breeds; Japanese quail)
- completion of gene bank in APRC Nitra
- sampling, genetic characterization and storage of genetic material in gene bank
- test of methods, development and optimization of cryoconservation methods for selected animal gene resources

Innovation of the information system "Electronic support of suckler cows – MADOBIS"

Leader of research team: Ing. Zuzana Krupová, PhD.

- information system (IS) **"**Electronic support of suckler cows" is being created with the aim to give the user a tool to model the production process on the basis of concrete or by the user entered inputs
- on the basis of input data from breeder (reproduction, production and economic parameters) provides the IS outputs to the breeder (results of herd turnover, gross and net production, economic parameters of herd efficiency) in form of reports, figures, tables and recommendations
- the application enables the user to work with IS, to model results of herd turnover, production, economic results on the basis of input data modification
- IS will be created in a form of web application and it will be available to breeders through the internet browser
- user operating environment of web application is designed in such way to be easy managed by the user and with logical link-up. IS is divided into modules linked-up logically. IS is created in free disseminated software means of WEB application (PHP, data base MySQL environment). IS together with breeders' data are deposited on the server and in the facilities of APRC Nitra and they are subject to safety protection from loss and misuse
- the programme package (software) is the basis of the information system; there are defined calculation algorithms of reproduction, production and economic parameters and all accompanying texts and recommendations, which follow from these values. The second part of the information system is the web site, which is important mainly from the viewpoint of user – breeder; it enables the work with programme package and its utilization for the needs of analyses of production and economic parameters of herd. The web site with changed design will provide an enlarged offer of modules free accessible for non-registered visitors of the site with general information on web site and methodical instructions for individual programme modules (herds, herd turnover, economy and modelling). At the same time more detailed information will be added on content and functionality of these modules.

Progressive technique and technology of breeding aimed at decrease of harmful gases emission from pig fattening

Leader of research team: MVDr. Zuzana Palkovičová, PhD.

The objective of this task will be to test the effectiveness of klinoptilolith added to feed on decrease of ammonia concentration in pig breeding and improvement of health and performance in animals.

Animal production is not only an important resource of food of protein origin but also a producer of ammonia that is present in animal excrements. Its presence in stables affects health and performance in animals mainly by irritation of respiratory tract mucous membrane and conjunctivae, which become an entrance gateway for the infectious agent. Besides direct influence on animals' health ammonia affects the environment as well. It participates in creation of acid rains, and after deposition also in acidification of soils, eutrophication of waters and nitrate contamination of underground waters. For the above mentioned reasons possibilities are searched for to decrease its release from excrements in stables, manure piles, slurry and from application on soil. Therefore it is the objective of this task to test exactly the effectiveness of additives on its release in stables.

Some types of zeolites and peat showed to be the most effective ammonia adsorbents. They have a large adsorption area and ability to change the cations. Klinoptilolith is studied as additive to excrements, litter and also as additive to feed. The results show that the application amount 5 kg/m^2 into litter reduced the ammonia concentration in air by 35 %.

The output of the task will be "The methodology with proposals of new technology processes and breeding technique, which will enable to decrease amounts of produced emissions in pig fattening".

Assessment of quality and utilization of alternative crops and feeds in relation to food production of animal origin, up-dating of national data basis of feeds

Leader of research team: Ing. Matúš Rajský, PhD.

Costs of inputs must be reduced and utilization of native feed resources must be intensified to make profitable the farm animals breeding as well as the extending farm breeding of game.

Attention is focused on alternative native resources of plant proteins, for instance on legumes, mainly with increasing prices for protein feeds. Pea is prospective out of legumes; its genetic fertility potential is sufficiently high (4 – 5 t of seed from hectare). In cattle feeding can be used not only grain but also the whole plant can be fed as silage, without other crops or in combination with other crop. Therefore the objective will be to test the nutritive value of pea for individual animal species and to recommend practical processes in nutrition.

During the recent years attention is paid to utilization of by-products from distilling industry (DDGS) in animal nutrition; it is a significant subject of research. DDGS reach approximately threefold value of crude protein (CP) and fat compared with the input raw material – cereal. With regard to these parameters represent DDGS a prospective source of CP and energy for animals. Therefore the objective will be to test the nutritive value of this by-product from distilling industry for individual animal species and recommend practical processes in nutrition for practice. Utilization of waste from production for feeding purposes is important also from the viewpoint of environment.

Production of clover-grass silages is of topic interest in mountain and foothill regions. The advantage of clover in grass mixture is greater stability and keepability compared with lucerne, therefore they appear as a suitable component of fodder crop stands. In our research we found out that the content of CP is below 140 $g.kg^{-1}$ dry matter in 70 to 87 % grass silages, and the content of CP is lower than 100 $g.kg^{-1}$ dry matter in up to 36 % grass silages. Low CP content gives evidence of minimal fertilization in stands. From this viewpoint is growing of clover-grass stands a positive solution that brings increase of CP in produced feed. The objective will be to elaborate practical directions for production of clover-grass silage of good quality for the practice.

Methodical manual will be elaborated within this task. It will contain new quick methods of mastitis infectious agent detection to be used immediately in primary milk production. The manual will be used by primary milk producers, zootechnicians,

management of agricultural enterprises as instruction to decrease the risk of mastitis occurrence, cause of origin, factors that influence the origin, directions for anti-mastitis measures, and prevention of mammary glands health in the herd. The objective is to give a system of anti-mastitis measures and instructions to the breeders of dairy cows and ewes in order to eliminate mastitis in herds.

Up-dating of the national data basis of feeds is also a part of this task. The data basis contains data about chemical composition, nutritive value and feed quality. The source of data will be own results of the Chemical and Physiological Laboratory of the Institute of Nutrition at the Animal Production Research Centre Nitra. The data will be statistically processed, archived and published. The aim will be up-dating of basic data basis of data that will be accessible to breeders, advisers, and creation of documentation for up-dating the legislation and innovation of evaluation system of the nutritive need and nutritive value of feeds.

Improvement of economy in bee-keeping using efficient bee lines in modern bee hive sets

Leader of research team: Ing. Ján Kopernický, CSc.

High losses in colony production are caused by ill managed measures called anti-swarm measures. It is necessary to use proper line of bees that originate in bee breeds. Mothers of unknown origin can greatly incline to swarming and show deterioration of other studied properties. Elaboration of the method to treat the colonies and subsequent spread of the treatment, which considers the knowledge of bee colony development in spring, and the incorporation of mothers from bee breeds into production breeds, should result in decrease of swarming percent and in increase of honey flow resources utilization.

Mutual harmonization of technological breeding possibilities with the biology of bee-keeping contributes to improvement of organization of work and economy of production. The focus of the task on condition balance in colonies at the beginning of season will create a precondition to save time by means of mass interventions. Planning of material necessary for bee keeping will create conditions for trouble free operation during the season, mainly: honey harvest, creation of new – reserve colonies,

bridging over the period without honey flow, treatment and preparation of bees for winter.

Another part of the task is to compare production costs, quantity of work and honey yields in three kinds of hive sets. Advantages of individual hive set types, with identical method of bee colonies treatment, will become evident by bee colonies taxation during the season.

Efficiency of purebred mothers will be compared with efficiency of free mated mothers. The contribution of mothers from bee breeds will become evident also in increase of breeding value in progeny at the given site.

Influence of agricultural production on bee colonies vitality

Leader of research team: RNDr. Tatiana Čermáková

In the apiculture practice are expected winter losses in colonies, which should not be higher than 10 % out of the total number of hibernating colonies. There should not arise any decay when the proper zootechnical processes are observed during the season. In spite of it we notice that the colonies are growing weaker or collapse during the short bee-keeping summer.

Health care for each farm animal consists of proper diagnose and subsequent therapy. Anamnesis, clinical examination of the animal supplemented with sampling and subsequent analysis, is always necessary for proper diagnose. Only from the complex of such data it is possible to diagnose properly. It is valid also for bee colonies; however, the situation is markedly complicated by utilization of pesticides or by occurrence of chemical matters in the environment.

If the bee colonies perish the breeders send only a sample of bees for laboratory analysis without the anamnesis. Particularly properly collected and evaluated anamnesis data with data about clinical state of colony are often the clue to diagnose properly the cause of bee colonies extinction. The laboratory diagnose itself is mostly only a tool to confirm or disprove the cause. To determine correctly the cause of mass decay in bees and marked weakening of colonies it is necessary to find the cause of this decay directly in the apiary of the breeder complexly on the whole territory of the Slovak Republic. It will be possible to recommend proper preventative or therapeutic

interventions to the breeder after the cause of weakening or decay of colony is detected.

In case of bee decay as a result of intoxication it is possible to recommend application of proper preparations in order to prevent poisoning of bees. Utilization of preparations for plant protection represents a significant risk for bees and other useful insects.

It is very important to assess the possible extent of negative impact on bees and other pollinators before the preparations are registered, and to propose proper process of application to minimize the risk of danger for bees and other pollinators – risk management. Estimation of risk for bees, when plant protection preparations are used, is important also to provide harmlessness to health of bee products, mainly honey and pollen.

The agricultural production is nowadays markedly oriented to growing crops in form of monocultures on large areas that subsequently do not provide sufficient natural resources of protein nutrition to bees, which cause weak condition in bee colonies. Therefore it is necessary to assess the nectariferous capacity and pollen richness in non-traditional crops – e.g. in plants of the genus Agastache, to create suitable mixture of different plant species to be used in apiculture and to incorporate these mixtures into crop rotation in cooperation with the agrosection. Vitality of bee colonies will rise by intake of protein and glycide nutrition from different plant genera.

Mass decay or marked weakening of bee colonies should be evaluated individually in the localities of the Slovak Republic as each of them can be caused by different factors.

Activities in special commissions of the Ministry of Agriculture and Rural Development (MARD) SK and acknowledged breeders' associations

Employees of the Animal Production Research Centre Nitra participate in the activities of the Breeders' Association of the Slovak Pied Breed, Meat Breeds Breeders' Association, Breeders' Association of Slovak Pinzgau Breed, Pig Breeders' Association, Sheep and Goats Breeders' Association, Slovak Association of Bee-keepers. They are members of selection and recognition commissions of the MARD SK for individual species and breeds of farm animals as well as members of breeding

boards. They perform approximately 65 official journeys with total costs approx. 7249 EUR to participate in these activities during the year. The current departmental projects of research and development are very specific and it is not possible to cover the travelling expenses for the above mentioned activities from them.

Activities of the qualified specialists from APRC Nitra in various commissions of the state administration, authorities of professional and interest groups, associations and other organizations in the Slovak Republic are very important. Exact evaluation, selection and controlled mating of high quality animals will result in improvement of requisite efficiency parameters, which brings improvement of production economy.

AGROFILM 2013

Head of the organizing committee: Ing. Ján Huba, PhD.

Agrofilm is an international film festival, unique in the world by its subject – films dealing with issues of agriculture, nutrition of population, food industry, ecology, and problems in rural areas are presented. The objective of the festival is to inform professional as well as nonprofessional public about the latest findings of science, research, development and practice in the above mentioned spheres.

Agrofilm is arranged by the Ministry of Agriculture and Rural Development of the Slovak Republic. The festival is organized by the Animal Production Research Centre Nitra in cooperation with the Food and Agriculture Organization, town of Nitra and Nitra's universities. The films in the competition are judged by an international jury.

The Industrial Property Office of the Slovak Republic placed the International Film Festival Agrofilm on the register of trademarks according to §33 section 1 of the Law No. 506/2009 L.D. on trademarks and allocated it the trademark No. 231796.

There will be following accompanying events during the festival: specialist discussions and lectures on quality and safety of foodstuffs, rural development and development in regions, dissemination of knowledge from science and research into practice.

In the past were the films projected only in the Animal Production Research Centre Nitra during the festival. In 2013 the projections and discussions on films will be

performed also in the centre of the town Nitra (in the Slovak University of Agriculture or in the Constantine the Philosopher University).

The festival films will be shown at non commercial projections in selected towns of Slovakia after the end of the festival. The films awarded prizes remain in the Agrofilm archives and serve to all, who are interested, especially to professional public and students. They are used during specialist courses, conferences and exhibitions on agricultural and food problems (e.g. in the Agroinstitute; during Agrokomplex exhibition).