

Creation and up-dating of specialised databases

Principal investigator: PaedDr. Michal Uhrinčat', PhD.

Objective of the task:

Design and implement a national data basis of feeds accessible on web site with data about chemical composition and nutritive value of feeds mostly used in our country; it will serve also as basis for up-dating of legislation and innovation of the systems evaluating the nutrient requirements and nutritive value of feeds.

Benefit of the task:

- breeders of farm animals will be able to assess more precisely the feed rations for animals according to their optimum needs on the basis of precise data of nutritive value of feeds listed in the data basis, and better utilization of feeds by animals will positively influence the environment,
- create an information data basis accessible on web site related to welfare of farm animals, which will help the breeders to manage the problems with legislative orders, minimum standards of animal protection and ways of welfare assessment with the aim to improve welfare and health in animals,
- design a structure and create a web site data basis of effective substances in preparations for plant protection according to the risk for bees and other useful insects on the basis of revaluation process with the aim to propose application of preparations (risk management) with the aim to minimize the negative risks for bees and bee products (to provide bee products harmless to health, without residua of the preparations used),
- provide high level of knowledge in employees of the APRC, students as well as scientific workers from other places of work and employees in the sphere of animal production. For this purpose will be improved and supplemented the own library stock, scientific and specialist journals, and the scientific journal Slovak Journal of Animal Science will be published,
- data basis of winning films from the International Film Festival AGROFILM NITRA will be created on web site to enable easier search for films according to years, theme and specialist categories of films, which are in the archives of APRC (for elementary and secondary schools, universities, interest groups and other users).

Programme of protection and utilization of animal genetic resources (cattle, pigs, sheep, poultry, Carniolan bee) in the Slovak Republic

Principal investigator: Dipl. Eng. Peter Polák, PhD.

Subject and objectives of the task:

- implementation of the programme of gene reserve maintenance in gallinaceous, domestic rabbit, Japanese quail and carp Sazan; observation of production and reproduction parameters, optimization of methods for assessment of cholesterol content in quail's egg with the aim to produce low cholesterol eggs in flock of laying strain,
- monitoring of animal genetic resources in farm animals according to their breeding and generic composition in cooperation with recognized breeding, charged and licensed breeding organizations,
- continuation of assessment of the genetic variability in the original Valachian sheep using the method of multiplex PCR,
- molecular-genetic description of Oravka hen, Carniolan bee and carp Sazan using the ISAG/FAO recommendations,
- operation of the national server EFABIS (European Farm Animal Breeding Information System),
- realization of international cooperation and representation of the Slovak Republic in ERF (European Regional Focal Point for Animal Genetic Resources) structures and FAO (Food and Agriculture Organization of the United Nations),
- processing of national documents and standpoints according to the requirement of state administration and international organizations,

- application of the latest biotechnological methods of ejaculate quality assessment in rams, rabbits and cocks; selection of the most suitable individuals, which will be included into the nucleus herd and used for insemination,

Contribution of this task is fulfilment of obligations of the Slovak Republic, which follow from Convention on Biological Diversity (1992), Global Strategy (1993) and Global Action Plan ZGZ (2007); maintenance of native breeds of farm animals and broadening of knowledge of ZGZ as well as broadening of possibilities to use them in production of foodstuffs and in development of rural areas.

Improvement of health, welfare and milk quality in farm animals

Principal investigator: Dipl. Eng. Vladimír Foltys, PhD.

Breeders in Slovakia must keep legislative requirements as far as protection and welfare are concerned.

Bad conditions on farms are the main cause of disorders in animals (mastitis, laminitis and metritis).

Selection of high-yielding animals for herds does not bring such positive results as the breeder expects. The main causes of it are mainly: not keeping the welfare in stables, bad organization of work and not respecting the biological needs of animals.

Also problems with milk quality are connected with it; they become evident by high intensity of milk gland disorders. The causes of problems in farm animal herds are of complex character and identification of possible factors is often difficult.

It is necessary to elaborate rules for housing and breeding animals respecting the valid legislation, and provide welfare for housed animals. Decisive role plays here the prevention of the above mentioned diseases in herds; programmes of health prevention in herds shall be elaborated subsequently.

Verification of accuracy of new regression equations in classification of slaughter pigs according to the decision of the Commission No 622/2009/EC, which approves the methods of pig carcass classification in Slovakia

Principal investigator: Dipl. Eng. Peter Demo, PhD.

Objective classification of pig carcass quality by the SEUROP system is the first precondition of fair realization of primary producers' production. For the conditions in the Slovak Republic approved the European Commission new regression equations for the two point or apparatus evaluation of quality in pig carcasses. The accuracy of new regression equations will be verified in a representative set of pigs in accordance with the approved legislation. The studied population of pigs will reflect the genotype and efficiency parameters (hybrid combinations of crossing, thickness of back fat and muscular substance) as well as ratio of sexes (approximately parity representation of barrows and gilts). The quality of pig carcasses will be assessed by three methods: ultrasound, optical and manual one; it will be compared with real content of total muscular substance determined on the basis of detailed dissection of half carcasses. Meat processing industry as well as pig breeders can use the results to improve the economic efficiency in production of slaughter hybrids.

Information system to support management of meat sheep flocks

Principal investigator: Dipl. Eng. Emil Krupa, PhD.

Objective of the task is to give breeders of meat sheep (more than 100 subjects at present) useful information in the sphere of economy, organization and technique of breeding, selection and breeding. The extension will be provided effectively in form of software available through web application or by personal consultations with breeders. The intent is an operative analysis of problem spheres in breeding and proposal of possible methods of solution. Hitherto knowledge from natural-economic analyses obtained from milk sheep breeders, who cooperate, will be used to create the software. Production and economic parameters are involved in particular, which

represent the given production system and participate in total costs and incomes of the breed. The developed software will be free-accessible via web application. The programme itself will be deposited on servers of APRC Nitra.

Effective nutrition and technique of animal breeding aimed at minimization of negative influences on environment

Principal investigator: MVDr. Soňa Nitrayová, PhD.

Modern nutrition of farm animals requires preparation of good quality, wholesome feeds with maximum utilization of potential sources of individual nutrients. Feeds of plant origin contain approximately two thirds of phosphorus in form of phytic acid salts, which are non-utilisable for monogastric animals and are excreted in faeces. It represents an important load on environment. Microbial phytase is an additive to feed mixtures accepted in the European Union that increases digestibility of phosphorus in organism of poultry and fattening pigs. In a selected group of sows will be tested the influence of graded administration of the microbial phytase additive into feed mixtures on phosphorus excretion into environment and its utilisation in the organism of sows. Besides phosphorus digestibility will be observed the influence of microbial phytase on digestibility of calcium, nitrogen, organic matter and dry matter. Improvement of phosphorus utilization will subsequently decrease its excretion into environment, which will contribute to ecologization of pig breeding.

Pig herds pollute environment also by production of toxic ammonia. One of the possibilities how to reach its decrease seems to be the use of special additives. Some types of zeolites belong among the most effective ammonia adsorption substances. The objective of the task will also be to test the effectiveness of natural zeolit – clinoptilolite – on decrease of concentrations and emissions of ammonia in housing facility by means of proper application of this additive into litter.

Another part of the task will be monitoring of selection of suitable maize hybrids grown in practical conditions of agricultural enterprises. Their quality will be assessed and it will be evaluated if the FAO of hybrids influences the content and composition of fibre complex (ADF, NDF) or the nutritive value. Assessment of maize silages will aim at elimination of losses arising at degradation of silages under the influence of various outdoor and indoor factors, and on aerobic stability of silages.

Benefit of the task is the characteristics of influence of the selected additives (feeding and silage ones, adsorbents) with detailed recommended way of their utilization. Their application in agricultural practice will enable to decrease morbidity in herds of animals, increase digestibility of individual nutrients resulting in increased gains and feed conversion. Also the aerobic stability of feeds will increase. Positive effect will be also decrease in concentration of pollutants (phosphorus, ammonia) in herds of animals.

Breeding, rearing and health measures to eliminate factors of mass collapse in bee colonies

Principal investigator: Dipl. Eng. Ján Kopernický, PhD.

During the last four years we were witnesses of mass collapse in bee colonies, which is called CCD (colony collapse disorders). In individual countries it takes place by combination of a number of factors, which cause area death of bee colonies. In EU states they are mainly chemical protection of plants and systemic preparations operating through the metabolism of plant, its nectar and pollen. Other ones are the parasitism of *Varroa destructor*, invasion of new bee diseases, contamination of bee products, pollen diets and mainly their synergism at sudden changes of climatic conditions. Extreme temperature fluctuations activate stress factors for the bee colony and its queen, which jeopardize them and can cause total collapse. If the bee keeper anticipates these stresses, it is possible to avoid the stresses using effective arrangements. The Slovak Carniolan bee is best adapted to native conditions, which is manifested in increased resistance to new pathogens, better adaptation at heavy climatic changes and resulting stresses, as well as better utilization of pasture conditions. There will be evaluated the importance of efficient

mothers from nucleus bee colonies, influence of bee hive system modernization, importance of placement of apiaries into more suitable locality with a more varied pasture, and further preventative anti-stress measures. In the summer period will be assessed the influence of brooding in bee colonies on foundation of large and healthy winter bee generation, which is able to resist extreme weather fluctuations. Membership to the Carniolan breed will be thoroughly controlled morphometrically in founders of lines.

Assessment of pesticide risk to bees and other arthropods in connection with realization of tasks according to the directive of the European Parliament and Council 2009/128/EC, which constitutes a frame for activities of the Community to achieve sustainable utilization of pesticides

Principal investigator: RNDr. Tatiana Čermáková

In October 2009 was passed the directive 2009/128 EC of the European Parliament and Council of 21st October 2009, which creates a framework for the activity of the Community to achieve sustainable utilization of pesticides (hereinafter only “directive 2009/128/EC”) – for individual member states follow duties from it; the most important duty is to create a National Action Plan (NAP), which will take into account all conclusions of the directive 2009/128/EC for the given state. NAP will be the starting strategy for optimum utilization of pesticides with minimum negative impacts on humans and environment. APRC Nitra – Institute of Apiculture took active part in preparation of NAP from the viewpoint of its expertise and it will prepare the part of NAP concerning apiculture in 2011.

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In case of incidents – poisoning of bee colonies caused by preparations for plant protection – it is necessary to develop a uniform system of registration and methods of solution in such cases. The Toxicologic Information Centre for Bees and Pesticides at the Institute of Apiculture should serve for these purposes. Organizational preparation of the work in the Centre and preparation of methodical processes and competences of individual interested organizations (State Veterinary and Food Administration SK and its sections, Central Controlling and Testing Institute in Agriculture and its sections, Institute of Apiculture, agricultural subjects) are a part of the task.

Utilization of natural effective substances to decrease infestation of bee colonies by the parasite *Varroa destructor*

Principal investigator: MVDr. Martin Staroň

Infestation of bee colonies by the parasite *Varroa destructor* creates serious problems in bee keeper practice for more than 30 years. During this period prevailed the opinion that the only way how to eradicate this parasite is the utilization of synthetic short and long operating acaricides. In the course of time it turned out that complete eradication is not possible. Synthetic acaricides remained in the bee keeping practice as common way to decrease infestation in bee colonies by the varroa. At present it is apparent that the disadvantage of synthetic acaricides is mainly their stable effective substance, to which the parasite can gradually build resistance, however, also the occurrence of residua in bee products is a disadvantage and it affects their quality negatively.

Nowadays are promoted medicaments on natural basis – organic acids, ethereal oils, tinctures – in therapy. Application techniques of these substances and their effectiveness were not tested sufficiently in the Slovak Republic till now. Missing data from tests hamper utilization of these preparations in bee keeping practice.

The objective of this task is to test the effectiveness of these substances and their forms of application. For this purpose it is necessary to put together a group of testing bee colonies in low multiple-storey hives arrangement. Effectiveness of individual organic acids and ethereal oils will be tested in cross tests performed on these bee colonies. The most appropriate application of these substances will be tested as well.

Specialist extension on implementation of the Counsel Directive 91/676/EEC on protection of waters from pollution by nitrates from agricultural sources (Nitrate directive) in conditions of the Slovak Republic for storage and manipulation with farm fertilizers

Principal investigator: Dipl. Eng. Vojtech Brestenský, PhD.

The work on this task will be performed on request of the Ministry of Agriculture and Rural Development (MARD) SK, Section for Environmental Activities, Agricultural Paying Agency, and agricultural enterprises.

Subject of the task will be:

- evaluation of some data obtained from the farmers during a questionnaire inquiry about storage capacities, management of farm fertilizers, etc on request of the MARD SK, Section for Environmental Activities,
- specialist cooperation at preparation of documents for negotiations on standpoints of the European Commission to the Action Plan and to implementation of nitrate directive,
- specialist cooperation at preparation of documents at creation of legislation,
- extension in the sphere of storage and manipulation of farm fertilizers,

Agrofilm 2011

Principal investigator: Dipl. Eng. Ján Huba, PhD.

The main mission of Agrofilm is to collect and disseminate knowledge and information of science, research, development and practice in the sphere of agriculture, food production, human nutrition, forestry, water management, biotechnologies, agro-ecology, problems regarding the countryside and life of its population, and also to present the problem of starvation and undernourishment in regions of developing countries. Besides, it shall draw attention to problems, which are not dealt with, and to expected problems and trends in given themes.

An international symposium with subsequent scientific discussion will be held during the Agrofilm 2011. Agency of the Slovak Academy of Agricultural Sciences will organize the symposium together with the Ministry of Agriculture and Rural Development SK and APRC Nitra.

Selected films will be projected on the whole territory of Slovakia for potential users during 6 months after the end of festival; the films in the deposit of APRC can be lend to persons interested in them (secondary schools, universities, interest groups, symposia, courses, entrepreneurial sphere) and they are used mainly as aids during the pedagogical process as well as opening films at important conferences and courses on agricultural and food themes