

**EDUCATION, SCIENTIFIC AND RESEARCH ACTIVITY IN ANIMAL HUSBANDRY OF REPUBLIC OF CROATIA****Gordana Kralik, P. Caput, Z. Steiner****Summary**

Education of agricultural experts has a long tradition in the Republic of Croatia. In 1860, the first Economy-Forestry High School was founded in Križevci, in 1919, Faculty of Economy and Forestry in Zagreb and in 1960, High Agriculture School in Osijek. Education of the animal husbandry experts is given at all the three mentioned institutions, and it has passed phases development equal to the social development and the constitution of the country. In 1990, by declaring the Republic of Croatia a sovereign and independent state, a new era started free of ideology, new courses and programs are prepared, in democratic countries with progressive animal husbandry. Research in animal husbandry is conducted at the departments of faculties and institutes. The Ministry of Science and Technology has financed 21 projects in which 148 scientists are participating. New projects are being prepared. Scientific potential in animal husbandry is a base and with adequate financial support it can improve animal husbandry development in Croatia.

Key words: animal husbandry, processing the land, pregraduate and postgraduate study, masters, courses, research work, high education

**Introduction**

Education of agricultural experts has a long tradition in our country, Long ago, in 1860, the first Economy - Forestry High School was founded in Križevci. During the rule of Austria and Austo- Hungary, Croatian people were constantly fighting for the education in the Croatian language and therefore the foundation of the first agricultural school is considered as an important historical event of ours. This school was our only agricultural institution through 60 years in which, besides schooling, scientific and expert work were developed in all fields of agriculture, e.g. animal husbandry. Until the school of Križevci was established, agricultural experts in Croatia were mostly foreigners with a quite small number of Croatians educated abroad. After the fall of Bach's absolutism, Austrian Ministry issued on April 12th 1860, a licence for the foundation of agricultural school named Royal

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Economy and Forestry School which on April 16th 1902, grew into Royal Economy High School. The Faculty of Economy and Forestry was founded on August 31st 1919, as the fifth faculty of the University of Zagreb and it continued the work of the previous two year Royal High School in Križevci and the three year Royal Forestry Academy (founded in 1887 and attached to the Philosophic Faculty in Zagreb). The Faculty for education of masters (agronomists) was founded in Croatia 47 years after the High School for the Culture of the Soil in Wien (1872), at which (from 1908) the Academic Society of the Croatian Agronomists "Lipa" was established.

The first president of the Agronomists Society, founded in 1924 in Zagreb, Prof. Oton Frangeš, graduate eng. (later a professor at the same Faculty) published a demand for the foundation of the Economy-Forestry Faculty at the University of Zagreb in "Narodne novine" on August 30th 1892.

Well-known as the fighter for the agricultural science and field expertise, at the gathering of the Agronomists Association in Zagreb in 1928, he emphasized: "The future of our people and state in the first place depends on the progress of our land cultivating. All the most progressive countries started their progress by developing their economies by the first in time and the most excellent in its importance skill of the man, that is the basis of all the other skills, culture and civilization". Ph. D. Oton Frangeš in the first Faculty Memory Book as the minister of agriculture has written: "Historical threshold of agriculture and civilization is processing the land".

The founder of the Department of Animal Husbandry at the Faculty was Ph. D. Albert Ogrizek, who become in the year 1923/24 Privatdocent. In 1960, High Agriculture School became in Osijek was founded, as a member of the University in Zagreb. Founding the University in Osijek, High Agriculture School became the Faculty of Agriculture-Food-Technology, and today it is the Faculty of Agriculture of the University of J.J. Strossmayer in Osijek. Education of the animal husbandry experts is given at all the three mentioned institutions, and it has passed development phases corresponding to the social development and the constitution of the country. In 1990, declaring the Republic of Croatia as a sovereign and independant state, a new era of our education started. Education plans were changed and freed of ideology, new courses and programs are to be prepared, like those in democratic countries with progressive animal husbandry. Unfortunately, these activities have been slowed down by the War and the occupation of some parts of our country.

### *The role and place of the faculty*

Changes which have taken place in the Croatian political and economic system have an impact on animal husbandry as a field of expertise as well as on the education of experts. In this whole system Agronomical Faculty in Zagreb and Faculty of Agriculture of the University of Josip Juraj Strossmayer in Osijek play a prominent role. Their fundamental activities are:

1. Education of livestock production experts  
- pregraduate study (4 years, graduate eng. of animal husbandry)

- postgraduate study (master of science or specialist)
- doctoral study (Ph. D. Sci)
- 2. Scientific and research work and implementation of research results into practice.
- 3. Experts' help for farmers, livestock production companies, industries for animal products processing, marketing and transport of animal products and others

By their capacities, faculties satisfy needs for education in pregraduate, postgraduate and doctoral studies. At The Faculty of Agriculture in Osijek and Agricultural Institute in Križevci a two year study has been organized (eng. of animal husbandry). In the year 1993, in the Republic of Croatia, 47 students obtained a dipl. eng. of animal husbandry diploma which makes 20 % of the total number of graduated students in the fields of agriculture. About 30-40% of the students who enrolled successfully completed their studies.

In 1993, the Croatian Parliament (Sabor) passed the new higher education law, which requires, beside changes in education, new educational plans and programs similar to those of distinguished western European universities. In that sense, prolongation of the studies from 4 to 5 years is forecast. Subjects are classified according to the importance into obligatory, chosen subjects and elective subjects (shares are: 70% : 20% : 10% from the total fund of lectures), which students study at specific departments (general and special livestock production, nutrition, milk production etc.). The number of theoretic lectures is to be reduced in favour of practical work, individual and group consultations. Classification of students for enrolling in the first year of study should guarantee transfer of 80% of students from the first to the second year of study with an appropriate education plan and program. Except a classification exam, there is a possibility of an interview - as additional criteria for the classification of students for livestock production studies. Post-graduate study should be adjusted to the new circumstances and should allow a variety in specialized studies.

#### *Scientific-research activity*

Research in animal husbandry is conducted at the departments of Faculties and Institutes. From 1991. until today, the Croatian Ministry of Science and Technology has financed 21 projects, mostly in applied and development research. In their carrying out 148 scientists are participating. Scientists who are registered in the Ministry as active researchers (expert collaborators, masters of science and doctors of science) can get a financial support for the research. Current researches comprise the fields:

- genetic improvement of the animals
- new technologies of animal breeding
- animal feeding
- animal reproduction using biotechnology
- improvement of animal products quality
- protection of endangered genetic resources of domestic animals.

In Table 1 the titles of the projects and principal researchers are shown, according to the institutions where the researches were conducted.

Within the genetic improvement field of work the research aiming to create the new genotypes and to develop the embryo transfer of the docile animals is important. The phenotypical, genetic and biochemical parameters of the most important economical and production characteristics are also being researched. The creation of the genetical collection of the autochthonous cattle, swine, sheep and goat breeds is in the process. Recently, we have been researching the milk and blood protein polymorphisms in some breeds.

The research in feeding comprises the setting of the feeding values for the cattle silage, as well as the usage of the herbal by-products in feeding the selected breeds of domestic animals. Besides, the digestion physiology, the influence of different meal composition upon the production characteristics of domestic animals is also being researched.

In addition to the research in the implementation of different technologies in the cattle husbandry, horse breeding, swine and sheep husbandry, livestock breeding and beekeeping in the specific production conditions of the Republic of Croatia and the impact upon the animal productive capacities, the quality of all kinds of animal products is being researched. The production of the biologically functional products has the priority for the country, as well as the research activity in these fields.

There are no international projects yet between Croatia and other countries that would be under shared financial arrangement but some are about to start. Great help for starting such cooperations will certainly be when Croatia joins the EAAP on January 1st 1993. Croatia has an active role in several regional associations (Alpe-Adria, Dagene etc).

Because of the difficult financial situation in the Republic of Croatia now, due to the War and the occupation of the parts of the country, resources for financing the projects have been significantly reduced. In 1992, the Ministry of Science and Technology helped the projects with cca 550,000 XEU. In 1993, financing the projects was dramatically reduced and only the resources for material expenses were approved. This situation has continued in 1994 as well. Equipment for scientific researches hasn't been acquired for years the existing equipment is and damaged in the War. Young, perspective researchers often abandon scientific institutions because of the poor working conditions.

It is expected that the situation will improve in the next period. Gaining the autonomy and independence the Republic of Croatia has become a subject and an equal partner in the creation of the scientific and research policy and in making international contracts. The scientific potential which is engaged in animal husbandry is a solid base and, with an adequate financial support for equipment and researches, it can improve animal husbandry development in our country.

The Croatian parliament (Sabor) passed, by the end of 1993, the Law on Scientific Research Activity, according to which the strategy in science is defined by the National scientific research program, suggested by the national scientific Council. Since the Government of the Republic of Croatia defined agricultural development as the one of

the strategic directions, it is expected that the financing of the science in the field of agriculture, hence animal husbandry will be improved. Connected to that, suggestions for the research directions are being discussed on all levels in the country (faculties, institutes, associations of experts, economic associations etc.).

Animal husbandry council of the HAZU (Croatian Academy of Science and Art) opened a discussion on future researches in animal husbandry, and the following directions of researches have been suggested:

1. Development of the animal husbandry in the spatial plan of the Republic of Croatia;
2. Maintenance and protection of animal genetic sources;
3. Biological, etiologiical, technical and ethic aspects of keeping and using domestic animals;
4. Phenomena of growth as a material basis of animal production;
5. Genetic and productive aspects of multiplication of the domestic animals;
6. Defining the relationship between environment and productive capacities of the farms and animals;
7. Morphological and physiological functions of animals with the aim of more efficient production;
8. Production systems and application of the scientific perception in technological treatments;
9. Genetic and biotechnological ways of production improvement;
10. Nutritive value and usage of animal food and its impact on the animal production quality;
11. Usage and management of the animal waste, excrements and residues of the plant production.

### *Conclusion*

Educational and research work has been organized in the Republic of Croatia for more than 130 years. Agricultural faculties and institutes have made a great contribution in education of agriculture, especially in animal husbandry field. A system of education is being changed in educational curricula and programs, so that the students can acquire knowledge with us as well in the same way they do in the West - European universities model.

The changes which stimulate the democratic society, private ownership with appropriate way of management, should find their focus in educational and research work. Because of strategic orientation of our country in agriculture and also in animal husbandry, a financial support must be more adequate. Equipment supply and to return dignity to the job is a prior task in this proces.

Table 1 - Principal researchers of projects in period from 1991 to 1994

Institution - Project	Principal researcher (surname, name)
Faculty of Agriculture in Zagreb:	
UTILIZATION OF AMINOACIDS AND MINERALS IN PARTICULAR PARTS OF DIGESTIVE TRACT OF ANIMALS	ČERNY, ZDRAVKO
HONEY-BEE AND HONEY PRODUCTS TECHNOLOGY	KEZIĆ, NIKOLA
EFFECT OF FEED ENERGY AND GENETIC BACKGROUND ON ENERGETIC STATUS OF COWS	UREMOVIĆ, ZVONIMIR
EFFECT OF PROTEIN GENOTYPE ON MILK YIELD, MILK FAT, PROTEIN, CASEIN	LUKAČ-HAVRANEK, JASMINA
BIOLOGICAL BACKGROUND AND ECONOMIC EFFECTS OF BEEF CATTLE INTRODUCTION TO MODERN AGRICULTURE	STIPIĆ, NIKOLA
GENETIC POLYMORPHISMS AND GENE COLLECTION OF DOMESTIC ANIMAL BREEDS IN CROATIA	CAPUT, PAVO
HEREDITY AND CHANGES OF COMPOSITION AND PROPORTION OF PIG TISSUE	JURIĆ, IVAN
UTILISATION OF OLIVE CAKES AS ANIMAL FEED	RUPIĆ, VLATKO
ADVANCE OF EMBRIOTRANSFER IN DOMESTIC ANIMALS	ROBIĆ, ZVONIMIR
Faculty of Agriculture in Osijek:	
FEED, NUTRITION AND ZOOTECHNICS AS FACTOR OF EQUILIBRIUM OF ANIMAL PRODUCTION IN SLAVONIA AND BARANJA	STEINER, ZDENKO
FACTORS OF HIGH-QUALITY POULTRY MEAT PRODUCTION	KRALIK, GORDANA
MODERN METHODS IN GENETIC IMPROVEMENTS OF CATTLE HORSES AND SHEEP	KNEŽEVIĆ, IVAN
Faculty of Veterinarian Sciences in Zagreb:	
GENETIC BACKGROUND FOR IMPROVING BEEF PRODUCTION	KARADJOLE, IVO
POSSIBILITIES OF CHANGES IN POULTRY INDUSTRY IN CROATIA	TADIĆ, VERA
ASSEMBLING OF IMPROVED MEAT-MILK TYPE SHEEP	MIKULEC, KREŠIMIR
NUTRITIONAL DISTURBANCES CAUSED BY RAPE OIL AND MEAL	VINOVRŠKI, ZVONIMIR
BIOCHEMICAL PARAMETERS IN THE EVALUATION OF FATTENING ABILITY	KRIŽANOVIĆ, DUBRAVKA
GENETIC AND PHENOTYPIC PARAMETERS OF PIG GROWTH AND REPRODUCTION	BALENOVIĆ, TOMISLAV
Agricultural Institute in Osijek:	
HYDROTHERMIC PROCESSED PLANT WASTES AS RUMINANT FEED	NOVOSELOVIĆ, ANTUN
Agricultural Institute in Križevci:	
PRODUCTION VALUES OF COLD-BLOOD STALLIONS AND MARES RAISED ON PASTURES	LJUBEŠIĆ, JOSIP
PK "Zadar" - Center for Development and Researching in Agriculture in Zadar:	
EFFECT OF GH, T4 AND INSULIN ON SYNTHESIS OF SOME MILK COMPONENTS	LOVRINOV, DANIJEL

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#### OBRAZOVANJE STRUČNJAKA I ZNANSTVENOISTRAŽIVAČKA DJELATNOST U STOČARSTVU REPUBLIKE HRVATSKE

##### Sažetak

Školovanje poljoprivrednih stručnjaka ima dugu tradiciju u Republici Hrvatskoj. Godine 1860. osnovano je prvo Gospodarsko - šumarsko učilište u Križevcima, 1919. osnovan je Gospodarsko-šumarski fakultet u Zagrebu, a 1960. godine Visoka poljoprivredna škola u Osijeku. Školovanje stručnjaka iz stočarstva obavlja se na sve tri navedene ustanove i prošlo je faze razvitka u skladu s društvenim razvitkom i uređenjem zemlje. Tek od 1990. godine, proglašenjem Republike Hrvatske samostalnom državom, nastupilo je novo razdoblje za naše školstvo. Izmijenjeni su nastavni planovi, deideologizirani su sadržaji, a pripremaju se novi kolegiji i programi, primjereni demokratskim zemljama s naprednim stočarstvom. Istraživanja u stočarstvu provode se na odjelima fakulteta i instituta. Ministarstvo znanosti i tehnologije financira 21 projekt, a u njihovom izvođenju sudjeluje 148 znanstvenika. U pripremi su novi projekti. Znanstveni potencijal je solidna osnova da, uz adekvatnu financijsku potporu, ubrza razvitak stočarstva u našoj zemlji.

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