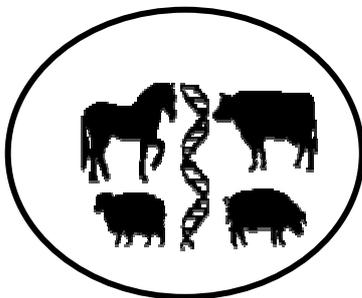


CZECH COUNTRY REPORT ON STATE OF FARM ANIMAL GENETIC RESOURCES

2003



**National Focal Point for Conservation and Utilisation
of Farm Animal Genetic Resources –
Research Institute of Animal Production
Praha 10, Uhřetěves**



**STATE OF FARM ANIMAL GENETIC RESOURCES
in the CZECH REPUBLIC**

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Introducing the Country – Characteristics of the Czech Republic and Its Agricultural Sector

The independent Czech Republic came into being in 1993, as one of the two successor countries of the former Czechoslovak Republic. It is situated in Central Europe between 48°33' and 51°03' latitude north and 12°05' and 18°51' longitude east and its neighbours are Germany, Austria, Slovakia and Poland. The country is a parliamentary democracy and the head of the state is the President.

The country's inland position on the boundary between the influence of the Atlantic and the continental climate causes year-on-year weather fluctuations and, together with the topographic characteristics, determines the specific production areas. The most productive maize and beet areas cover approximately 35 per cent, and the least productive highland/mountain areas 25 per cent of the country's surface. The productive areas are characteristic of their mixed types of agricultural production (crop + livestock production), while the highland and mountain regions with minimum arable land are oriented towards livestock production. These regions form a boundary belt encircling the Bohemian inland basin and, with the exception of the Central and South Moravian lowlands, they cover a large part of Moravia-Silesia. The highest-lying cultivated areas rise to an altitude not exceeding 1200 m a.s.l. Average temperatures and the annual precipitation amount range between 4.5° C and 9.5° C and 450 and 1100 mm depending on the region. The Czech Republic covers an area of 78 866 km² and its population (*Statistical Yearbook 2000*) is 10 309 137, resulting in a density of 131 inhabitants per km². As in most European countries, the population of the Czech Republic is stagnant, with a slightly declining trend (decrease for the decade is 0.8 per cent). Since 1996 the number of immigrants has been continuously rising, and this fact has begun to locally influence demand for certain animal commodities (mutton, goat's meat). There is a distinct difference between the economic standards of people living in towns and the countryside. The rural areas, especially the traditional



agricultural regions and some parts of the country with heavy industry, are affected by high unemployment, so that the self-supplying system of keeping rabbits, hens, sheep and goats persists. With the social differentiation of the population and the changes in its life style, the breeding of horses and some new and exotic species (lamas, ostriches), is on the increase.

Traditionally, the Czech Republic is a predominantly industrial country, with 4 280 000 hectares of land available for agricultural use. Of this area, arable land accounts for 3 096 000 hectares, meadows and pastureland for 953 000 hectares, orchards, hop-fields and vineyards for 72 000 hectares and gardens for 159 000 hectares. In the past decade, the percentage of cultivated arable land was reduced to 72.2 per cent, but in spite of this the said percentage is the highest in Europe. Only a negligible number of enterprises produce animal commodities without farm land (industrial broiler poultry, rabbit and pig farming).

In the year 2000, Czech farm production was worth 118 billion CZK (approximately 3.7 billion USD) in current prices. This is 28.2 per cent less than in the period before 1990, with animal production having dropped by as much as 34.6 per cent and crop production by 22.7 per cent. Agriculture's share of GDP has dropped from 7 per cent to 1.8 per cent. The decrease in the size of agriculture was accompanied by a dramatic decline in the number of people working in this sector. Altogether 325 000 workers have left this sector since 1989. Currently there are some 180 000 people working in agriculture and the share of agriculture in total employment thus fell to approximately 4.5 per cent. Of this number, 27 per cent of the workers have university or secondary education, they are familiar with the new technological and environmental trends and are capable of adjusting themselves to them. Some 56 600 entities are actively engaged in farming, employing 168 000 people on a full-time basis. The structure of farming enterprises is shown in the following Table 1.

Tab. 1 - structure of farming enterprises

Type of enterprise	Number of farms	Average area (ha)	Share of farm land (%)
Private/family	33 000	25	24
Limited liability co.	1 800	430	22
Joint stock co.	600	1 150	21
Co-operatives	800	1 400	32
State and other	400	80	1
Total	36 600	96	100

Source: Green Report 1999, Ministry of Agriculture

The largest proportion (48 per cent) of farms have less than 2 hectares of farmland. Farms with over 100 hectares account for a mere 5.7 per cent, and only 4.2 per cent of farms have no farm land (Tab. 1.5 in the Annex).

With the exception of exotic commodities (tropical and subtropical vegetable products) and salt-water fish the Czech Republic is self-supplying in foodstuffs. Animal production accounts for 54.8 per cent of total agricultural production, of which the largest share (30 per cent) is accounted for by milk, with pigs accounting for 29 per cent and cattle for slaughter for 14 per cent. Since 1989 the intensity of farm animal farming has dropped from 93.4 to 52.2.4 livestock units/100 ha. Changes in the livestock populations, which occurred from 1990 to 2000, and the corresponding changes in the production and consumption of animal products in the same period are shown in Tables 2 and 3.

Tab. 2 Changes in the livestock populations (thousands of head)

Year	1990 (1.3.)	2000 (1.3.)	Index 1990/2000
Cattle	3 506	1 573	0.45
Sheep	430	84	0.19
Goats	39	32	0.82
Pigs	4 790	3 417	0.71
Poultry	31 981	30 784	0.96
Horses	27	24	0.89

Source: Agriculture in the Year 2000, Ministry of Agriculture of the Czech Republic

Trends towards health food consumption, price difference and falling interest in dark and fat meat and animal fats has led to higher poultry consumption (chicken broilers and turkeys). (Tab. 3)

Tab. 3 – Production and consumption of animal products

	Production (Live weight)	Per capita consumption
Year	2000	2000
beef	208 000 t	13.8 kg
pork	583 900 t	44.7 kg
poultry	294 000 t	20.5 kg
mutton and goat's meat	900* t	0.1* kg
other	40 000 t	3.7 kg
meat, total	1 126 700	83.3 kg
milk	2 708 mil. l	214 kg
eggs	3.06 mil. eggs	297 eggs

Source: Agriculture in the year 2000, Ministry of Agriculture of the Czech Republic

* mutton and goat's meat production and consumption are not recorded separately; the stated number is an estimate based on statistical data relating to animal stocks

The entire process of food and animal raw material production and treatment is subjected to veterinary supervision of their safety, which is carried out by the State.

Efforts to make the agrarian sector competitive in relation to the EU and the world in general, while maintaining intensive and extensive agriculture on the largest possible area, are also reflected in the emphasis placed on the development of the non-production functions and permanent and friendly utilization of rural areas.



Part I. State of Farm Animal Genetic Resources

I.1. Production Systems and Biodiversity

The current production systems in the Czech Republic are the culmination of the long-term process of their development. While the characteristic feature of the postwar period (until 1948) was the predominance of small farms with small-scale production, the subsequent period (1948-1989) was marked for a number of changes with a significant impact on animal production, including changes in the production systems. The collectivization of agricultural production resulted in the nearly one-hundred-per cent existence of co-operatives and state farms and gradually developed into a command system centrally directing the volumes, structure and prices of production. In the early 1950s, artificial insemination was introduced in cattle farming, reaching up to 98 per cent, and was gradually accompanied by the construction of standardized large-capacity cow-houses with machine milking. Simultaneously, accurate records were kept of the cow and heifer populations and the milk yields (covering up to 95 per cent of the cow population), while reproduction was centrally controlled by the breeding and reproduction service.

This process led to considerable specialization in farming. The dairy cattle farming programme underwent an important development and the milk yields of the meat-milch cattle kept improving. In pig farming, a differentiated system of sow and piglet rearing and pig fattening developed into specialized units. In poultry farming, too, specialized enterprises were built for egg production and poultry fattening, while sheep rearing concentrated on wool production.

Further important changes took place in connection with the political and economic changes occurred in 1989 and the launching of a market-oriented economy system. The volume of production, especially of milk and beef, decreased, reflecting the lower demand for these commodities and resulting in a dramatic decline in the cow and cattle populations.

The structure of animal production was strongly influenced by state support and state subsidies, granted on a long-term basis, the main purpose of which is the maintenance and improvement of the genetic potential of farm animals and the strengthening of the multifunctional character of agriculture, as well as under short-term arrangements, which change operatively according to immediate needs. No major changes are expected in the production areas, mainly in the lowlands. On the other hand, in the mountain and piedmont areas, conditions are being created for the development of extensive and ecological forms of farming and agritourism.

For the time being, the distribution of the species and breeds is determined primarily by natural conditions, i.e. the availability of feed supplies and farming technologies.

In cattle farming, in connection with changes in consumer demand and the changed subsidy granting policy, milk production has declined dramatically. The **dairy cow** population has decreased by 53 per cent, to about 550 000 head; on the other hand, the yields have substantially increased and currently range over 5200 kg per lactation on an average. The higher yields are the result of the continuously improving genetic work of breeders and a significant improvement of the production environment conditions. Under a long-term programme for the development and support of cattle farming, the restructuring of the population into the dairy and meat types has intensified. The original breed in the Czech Republic is the traditional Bohemian red-pied cattle, being upgraded for combined meat-milk yields (199 000 cows in performance recording, 5579 kg of milk). The second most important breed with high milk yields is Holstein cattle (164 000 cows in performance recording, 6921 kg) and its crossbreeds (22 500 cows, 5457 kg). Breeds such as Montbeliard, Jersey and others in performance recording total 6 400 cows. The development and availability of modern technologies have improved conditions for the introduction of high-input systems and highly productive breeds. These systems are considerably dependent on special fodder production, improved veterinary and breeding care and high-standard stalling and milking.

Tab. 4 – Basic milk production indicators

Year	1990	2000
Average number of head of cattle	3 506 000	1 582 000
of which: dairy cows	1 126 000	547 500
suckler cows	0	67 300
Milk yield kg/lactation	3 982	5 255
per capita consumption (kg/year)	259.6	214.0

Source: Agriculture in the year 2000, Ministry of Agriculture of the Czech Republic

Twelve specialized **meat breeds** are kept for beef production. Their populations are increasing, especially in the less favourable areas, with important subsidies from the state. Also used is the system of suckler dairy cows without market milk production, mated to meat-type bulls, based on grazing for the entire vegetation period. Some 70 000 suckler cows are currently kept and it is estimated that their populations will further increase. The introduction of the compulsory classification of carcasses according to SEUROP standards with an expected desirable price differentiation of meat according to its quality will further stimulate the farming of meat-type breeds. Certified BIO ecological production (specially labelled meat of meat-type breeds) is on the increase.

Pig farming is based on the traditionally high pork consumption (45 to 50 kg per capita annual consumption). Pig production is based on paternal and maternal breed farming and the hybridization system. Included in the hybridization programmes are domestic White large and Landrase breeds as maternal populations, and Duroc, Hampshire, White large/ paternal line, Czech markedly meat-type, Pietrain and Belgian landrase breeds are used as paternal populations. The technological breeding systems are based on the industrial-farming technologies (stalling + 100 per cent use of commercial fodder mixtures). In addition to 580 000 tons of market production, another 80 000 tons is accounted for by smallholder subsistence slaughters. The SEUROP method is used in the slaughterhouses for assessing the quality of carcasses.

The production and consumption of **poultry** meat is increasing. This growth is partly influenced by the more favourable prices in comparison with other kinds of meat. There is especially higher demand for chicken and turkey meat; the



consumption of waterfowl meat is stable. Broiler chickens and turkeys are kept on thick bedding, and the fattening of the turkey hens and turkey cocks is carried out separately. The fattening of waterfowl on fishponds is being gradually substituted by fattening in halls all the year round. More than 80 per cent of the commercial production of hen eggs is produced in facilities with a capacity of more than 50 000 hens; 55 – 60 per cent of facilities use cage technologies. The traditional farming in facilities with hen outlets has a chance in welfare or organic farming systems.

In **sheep farming**, there is a gradual shift from wool production to increased reproduction and combined wool-meat production. The original merino population is being gradually turned into a meat-type population or the dual-purpose type with the use of meat-type breeds. Intensive mutton breeds (Charollais, Texel) are tied to good-quality grasslands and preferably flat terrain, while the highlands and mountains provide suitable pasturage for other breeds. All-year pasture breeds requiring no housing include the Romney Marsh and Suffolk breeds. Cross-breeding with the East-Frisian breed is used in dairy sheep for the rapid raising of yields and meat value. The choice of meat breeds is sufficient. In the year 2000, the sheep population consisted of 30 per cent of meat-type breeds, 3 per cent of reproductive and dairy breeds and 67 per cent of dual-purpose breeds. Nearly 80 per cent of breeders have herds with under 10 heads of sheep..

Goat farming is a completely new branch developing since 1990, which uses the country's both original breeds, the White and Brown short-hair goat. Some 30 enterprises with 1500 goats are engaged in goat farming, and another 30 000 goats are kept in households. In the production of kids for slaughter, cross-breeding with the meat-type Boer breed is being used increasingly.

Rabbit farming has been introduced as a completely new branch. Some of the intensive farms are using modern technologies based on hybrid broiler farming and the use of fodder mixtures; in small-scale farming, the traditional home feeding prevails. The growing number of animals in rabbit farming (360 per cent

of the 1989 level) reflects the good rabbit meat export opportunities (90 per cent of total production). The former production of skins from domestic breeds (with colour strains as an imitation of expensive furs) is economically unviable (less than 20 per cent of the 1989 price level). **Nutria farming** is carried out on a limited scale, with medium intensity.

In **horse** breeding, the breeds are specialized for different uses: the English thoroughbred for racing, the Czech warmblood for riding and sport, the Old-Kladrubby horse is a carriage horse, the Hucul is a riding and draught horse used in mountain logging, the Silesian norik and the Bohemian-Moravian belgik are draught breeds also used in logging. Usually the horses are raised in the traditional way in herds when young and are used for work in adult age. That is why emphasis is placed on performance tests, which take into account the specific qualities of the different breeds.

The traditional Bohemian **fishery** focuses on carp, which accounts for approximately 90 per cent of total fish production. The overall area of fish ponds is 52 000 ha. The production of carp and other economically important fish species is the result of the reproduction process linking up primarily with domestic breeding. In the final analysis, the size of production influenced the breed structure: historically, for example, in the case of carp, the breeds developed by directional and stabilization selection for weight and scutation. Efforts to raise non-specific resistance led to cross-breeding (often empiric and even intuitive), sometimes resulting in crossing-over and the extinction of some original and acclimatized breeds (1940s to 1980s). Merchantable hybrids are now used for production. Well-tested cross-breeding patterns have existed since the 1980s, and their use is recommended; at present, the testing is done by controlled diallel or vertical crossbreeding. Total per capita annual fish consumption in the Czech Republic is 5 kg of freshwater fish and 3.7 kg of saltwater fish.

In the framework of the main production systems the following original or locally adapted and exotic breeds are used to a varying extent.

Tab. 5 - structure of farmed breeds

Species	Indigenous and locally adapted breeds	Exotic and recently introduced breeds
Dairy cattle	Bohemian Red Czech Red Pied cattle Holstein-Friesian	Montbeliard Jersey Ayrshire
Beef cattle	Czech Pied cattle	Aberdeen Angus Beef Simmental Belgian Blue Blonde d'Aquitaine Charolais Galloway Gasconne Hereford Highland Cattle Limousin Piedmont Salers
Sheep	Shumavka Valachian Improved Valachian Tsigai Mutton Merino East Friesian Dairy Suffolk Merino	German Blackheaded Mutton Cameroon Zwartbles Jacob Olkusz Charollais Texel Romanov Berrichone du Cher Clun Forest Hampshire Down Bergschaf Merinolandschaf Merino Longwool Romney Marsh Oxford Down
Goat	White shorthaired Brown shorthaired	Kashmere Angora Boer
Pig	Czech Landrace Prestice Black Pied Large White/ dam line Large White/ sire line	Duroc Hampshire Landrace Pietrain Belgian Landrace
Horse	Old Kladruby Horse Hucul Silesian Noric Czech-Moravian Belgik Czech Warmblood	Haflinger Achal-Tekin Altai Lipica English Thoroughbred Arab Shagya-Arab Noric Welsh Pony Shetland Pony

Tab. 5 (cont.) - structure of farmed breeds

Species	Indigenous and locally adapted breeds	Exotic and recently introduced breeds
Chicken	23 breeds in hobby breeding*	Hybrid populations Tetra, Hisex, Dominant, Cobb, Ross in industrial farms, next 17 breeds in hobby breeding*
Guinea Fowl	White Blue	Violet
Rabbit	29 breeds*	
Nutria	12 breeds*	
Fish	32 breeds of carp, tench, salmon trout, rainbow trout, catfish, whitefish sturgeon	23 breeds of carp and rainbow trout
Honey Bee	Carniolan	

* see annex



I.2. State of Conservation of Farm Animal Biological Diversity

The state contributes significantly towards maintaining the biological diversity of farm animals by taking and applying legislative measures, originally Act No. 240 passed in 1991, and especially its amendment (Act No. 154/2000) on the improvement, breeding and registration of farm animals, with implementing regulation No. 471/2000. The Act stipulates and defines the duties and rights of authorized persons and farming associations to carry out the relevant specialized activities (performance recording, carrying out performance tests, judging the animals, running insemination stations and carrying out insemination, embryo transfers, etc.), as well as the duties and rights of individual breeders and their associations and breeders' unions, the aim being the successful improvement of animals and follow-up livestock production. This amendment contains a separate paragraph, "genetic resources", which stipulates that the following breeds shall be included among the genetic resources:

- a) in cattle: Bohemian red, Bohemian red-pied cattle
- b) in pigs: Přeštice black-pied pig
- c) in horses: Old-Kladruby horse, Bohemian-Moravian Belgian horse, Silesian norik, Hucul horse
- d) in sheep: Šumava sheep, Wallachian sheep
- e) in goats: the White and Brown short-haired goat
- f) in poultry: Bohemian gold-speckled hen and Bohemian goose
- g) in fish in approved forms and lines: common carp, rainbow trout, common trout, whitefish, maraena, common tench, sheat fish, sturgeon, great sturgeon
- h) in bees: Carniolan honey-bee

The paragraph specifies the way of maintaining the genetic resources by pure-blood breeding in closed populations and by the cryoconservation of cell sperms and embryos. All breeds of the predominantly local and autochthonous



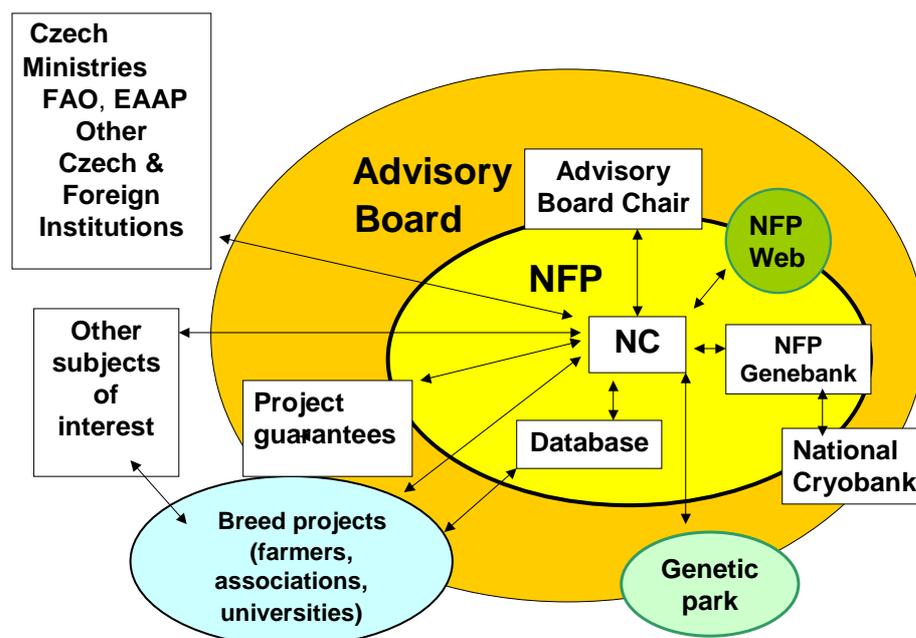
species with a limited and declining number of animals are included in the conservation programme. In 1994, the Convention on Biological Diversity adopted in Rio de Janeiro in 1992, came into force in the Czech Republic, and as Communication of the Ministry of Foreign Affairs No. 134/1999 was incorporated in Czech legislation.

In this connection, it is appropriate to mention the country's previous activities, which were also important. The former Czechoslovakia, and since 1993 the Czech Republic, have done much for the maintenance of the genetic resources of farm animals of all numerically small local and autochthonous breeds. Besides Act No. 240 mentioned before, which was passed still before the Convention on Biological Diversity was signed, the stud farm at Kladruby nad Labem, which has been breeding the autochthonous breed of the Old-Kladruby horse for more than 400 years, in 1995 was awarded the title of National Stud Farm, with the statute of an "Object of National Cultural Heritage". The stud farm was founded in 1579 and now comprises some 130 mares of both colour varieties (white and black) with complete pedigrees going back 13 to 14 generations. The work of the National Stud Farm at Kladruby nad Labem is supported by the Ministry of Agriculture of the Czech Republic.

On the basis of Act No. 240 mentioned above and the Convention on Biological Diversity, in 1993 the Ministry of Agriculture prepared a National Programme for the Protection of Biodiversity for Nutrition and Agriculture, which gradually covered the genetic resources of plants, micro-organisms, farm and domestic animals, fish and bees, thus ensuring the conservation of the full range of genetic sources. The law stipulates that the National Programme for the Conservation and Utilization of the Genetic Resources of Farm and Domestic Animals, Fish and Bees in the Czech Republic (hereinafter National Programme) shall be prepared and ensured by the Research Institute for Animal Production (Výzkumný ústav živočišné výroby) in Prague 10 – Uhřetěves as the National Focal Point. The National Programme is an open system making it possible to include other, immediately endangered breeds or lines, and restrict breeds that have been numerically stabilized. The project for each breed has its guarantor and supervisor, through whom the Council of

Genetic Animal Resources established by the National Focal Point co-operates with the institution concerned, mainly with the breeders' Associations. Breeding methods have been prepared for individual breeds; the financial estimates of state support to breeders are made each year and so is a summary evaluation of the project. The breeders of animals included in the National Programme obtain a financial contribution from the state, in accordance with accurately formulated conditions announced by the Ministry of Agriculture of the Czech Republic. This makes it possible to regulate their number according to the requirements of the approved methods. Financial contributions are distributed to the breeders concerned through their breeders' organizations. Every year, the Council for Genetic Animal Resources prepares an annual report, which comprises a description of the activities of the National Focal Point, including international activities, the distribution of funds and annual reports prepared by individual guarantors for all the individual animal breeds. The National Focal Point activates the cryoconservation programme and the programme for the use of molecular genetics methods for the monitoring and description of the genetic material of all breeds included in the National Programme.

Diagram 1 - Scheme of the National Programme administration.



Tab. 6 – Survey of supported breeds and their guarantors in the framework of the National Programme(2002)

Breed	Guarantor	Co-operation	Number of supported individuals in 2002
Bohemian red	VÚŽV Uhřetěves	Czech agricultural university University of South Bohemia	115
Bohemian red-pied	Breeders association of Bohemian red-pied cattle	Czech and Moravian Breeders association	Insemination doses only
Shumavka sheep Valachian sheep	VÚŽV Uhřetěves	Sheep and goat breeders association	2391 118
White shorthaired goat Brown shorthaired goat	VÚŽV Uhřetěves	Sheep and goat breeders association	1551 380
Prestice pig	VÚŽV Uhřetěves	Pig breeders association	377
Old-Kladruby horse	National Stud Farm KLadruby		70
Silesian noric horse, Bohemio-Moravian belgic horse	Horse breeders association		28 62
Hucul horse	Hucul horse breeders association		55
Bohemian goose Bohemian gold- speckled hen	International poultry testing company	Czech breeders association	142 337
Rabbits (Moravian blue Bohemian albino Bohemian lofer Bohemian piebald Moravian brown eyed white, Bohemian red Black kemped)	Czech agricultural univesity	Czech breeders association	1016
Prestice, standard and silver nutrias	Czech agricultural univesity	Czech breeders association	163
Fish (common carp, common tench, rainbow trout, common brook trout, sheatfish, whitefish, maraena and sturgeon)	University of South Bohemia – research Institute of fishery and hydrobiology	Anglers association	39 shoals
Carniolan honey bee	Research institute of apiculture	Czech beekeepers association	359 colonies

I.3. State of Utilization of Genetic Resources

Part of Act No. 154 is a description of improvement activities and a list of indicators evaluated through performance recording and testing of the breeds of the different animal species.

In dairy cattle, the evaluation involves milk yields, milking capacity, reproduction properties and appearance, in the dual purpose type, in addition, the meat yield. In the meat-type cattle breeds, the monitoring includes reproduction indicators and earliness. The monitored data serve as a basis for estimating the breed value for the different properties being monitored. The methods used are modern mathematical procedures with the use of available information about the yield values of ancestors and siblings.

In pigs, the monitoring concentrates on the reproduction properties of the breeds, their fattening properties, carcass yields, selected genetic characteristics and appearance, and in reproductive breeds the reproduction and fattening properties. The information thus gained is used to calculate the breeding values for the monitored properties and integrated in the general breeding value.

In sheep, the monitoring focuses on the reproduction properties, appearance and growth, in wool-type sheep on the quantity and quality of the wool, in meat-type sheep on the meat value and in milch-type sheep on the milk yield. In goat farming, the monitoring is similar. It focuses on the reproduction properties, appearance and growth and with regard to production properties on the milk yield (quantity of milk, content of components and in dairy breeds on the milking capacity), in meat-type breeds on the meat value and production and in hair breeds on hair production and quality.

In warmblood breeds of horses bred for performance in sport riding, the type of breed, appearance, movement mechanics and performance are monitored before entering the mares and stallions in the studbook. In other horse breeds the situation is similar. The testing and assessment is done with the help of the



point system or linear description, in accordance with the appropriate breeding programme for the particular breeds.

In all poultry breeds, the monitoring includes the size and quality of the lay of eggs, the type of breed, the appearance of the fowls and their reproduction properties in connection with the breeding and hybridization programmes.

A summary of results for all the above-mentioned species and breeds are published annually, at least once a year. Pedigree books (breeding records) are kept for each breed, in which the results for male and female animals are entered. Stud horses, bulls, boars, rams and bucks are recorded in a special State stud register. Breeding records make it possible to issue documents on the origin of the breeding animals, fowl, fish and bees. All breeders with more than one pig, more than three sheep (goats) and all cattle and horse breeders are obliged to identify and mark the animals in the prescribed way and have them centrally registered. The rules for marking and registering small animals and poultry are set by the appropriate breeders' associations.

Separate breeding and conservation methods have been worked out for the different breeds of the listed animal genetic resources, depending on the size of the populations. The original methods prepared in 1996 were amended in 2001. The National Focal Point keeps a database for the protected breeds and animals. The data are available to the State Veterinary Administration of the Czech Republic for it to be able to take the necessary zooveterinary measures in case of danger or if other interventions are needed. The National Programme ensures the conservation of breeds mainly by the *in situ* method; gradually, the *ex situ* conservation method is being introduced. The National Focal Point organizes a continuous cryoconservation programme and a programme for the storage of the existing genetic material and the use of the molecular genetics method for monitoring. The following collections of cryoconserved material are available so far (June 2002):



Bohemian red – 7 200 insemination doses and 50 embryos

Bohemian red-pied cattle – 11 500 insemination doses and 706 embryos

Black-pied Přeštice pig – 220 insemination doses

Šumava sheep – 350 insemination doses

The cryoconservation of fish sperm and the sperm of both goat breeds is carried out on a continuous basis.

The use of molecular genetics methods for characterizing the genetic variability and the study of interbreed distances have brought partial information so far:

In the *Bohemian red* cattle, the protein polymorphism of casein alleles was compared with that of the populations of the Polish and German red breeds and the frequency of specific haplotypes was determined. In Bohemian red-pied cattle, β -lactoglobulin and κ -casein polymorphism was assessed in detail in the progeny of individual bulls. In the *Wallachian and Šumava sheep*, selected microsatellite loci were monitored in comparison with the improved Wallachian breed to calculate their genetic distances. In the *White goat and the Brown goat*, genetic distances were calculated between the two breeds and the κ -casein polymorphism was assessed. In *pigs*, polymorphous genetic markers, including the alotype loci of the blood groups, enzymatic and polymorphous protein loci were described and genetic distances among the maternal breeds (Přeštice, White large, Landrase), the paternal breeds and their F1 crossbreeds were determined. Genetic analyses are an inseparable part of the conservation of genetic fish resources. In *carp, catfish, tench, trout and whitefish (marasena)*, analyses are made of polymorphous proteins, and the genetic purity and variability of the shoals and their genetic relationship or distances are monitored. In the carp population, the variability of mitochondrial and nuclear DNA is examined by microsatellite analysis. In tench, trout, sturgeon and catfish, in addition, cytogenetic analysis of *ploidia* and chromosome analysis are used. In horses, a study was made of the genetic distances of the *Old-Kladruby* breed.



I.4. Critical Areas and Reserves

High input/high output breeds gradually predominate in most technologies and the farming of less numerous populations with lower yields is only possible with financial support to set off economic losses. In general, this aspect is further aggravated by the overall financial uncertainty of farmers and the low profitability of animal production. The older generation of breeders is retiring without being substituted by a sufficient number of young breeders, whose priority would be the maintenance of traditional breeds.

Some reserves rest in the use of biotechnologies, such as laparoscopic insemination and embryo transfer; reliable cryoconservation technologies, especially in the case of small animals (rabbits, poultry), however, are missing.

Another reserve rests in the genetic description of conserved resources. This problem is not being solved systematically. It would be useful to specialize some of the specialized departments or teams and co-ordinate their activities.



Part II: Change in Requirements for the National Animal Production Strategy and Programme

II.1. Overview of Past Policies, Strategies and Programmes for the Utilization of Genetic Resources

The state of the current genetic diversity of farm animals in the Czech Republic is a reflection of the previous orientation of production targets pursued in the process of breeding in different species and breeds. An example is the development of the originally unified Simental-type red-pied cattle on the entire territory of today's Czech Republic. Efforts to increase milk yields led to the controlled immigration of Ayrshire and later Red-pied Holstein cattle in half of the population, and to cross-breeding (later conversion-crossing) with Lowland black-pied and later Holstein cattle through the import of animals and sperm in the other half. The result of this process is the concurrent realization of separate selection programmes and the existence of separate populations (breeds), i. e. Bohemian red-pied and Holstein cattle. The gradual development of beef cattle farming led to breeding specialization in a part of the original Bohemian red-pied cattle and the emergence of a separately developing and managed population of meat-type Simental cattle.

The new market-economy system introduced in the country made it possible to import and use new breeds of beef and dairy cattle, sheep and goats. These imports were subsidized and the farming of these animals is combined primarily with subsidies granted especially to the grazed farming of ruminants in marginal regions.

Subsidized wool production, which contributed towards the promotion of sheep rearing (430 000 head in 1990) and the dual purpose wool-meat breeding strategy in the transformation period, with the simultaneous decline in world wool prices led to the collapse of this branch. The collapse of the sheep wool market resulted in the restructuring of the wool-meat orientation of farming and a decline in the sheep population, which in the year 2000 totalled 84 000 head.



In small farm animals (rabbits, poultry) the traditional breeds were maintained despite the predominance of industrial poultry and chicken hybrids. The large number of breeds is the result of the long farming tradition of small-scale “hobby” farming of individuals associated in breeding clubs of the Czech Breeders’ Union. During the past decades, the Union’s work was made possible by the state support it obtained within the social policy of promoting village activities. This is largely responsible for the present high standard of these “hobby” breeds.

II.2. Impact of Changes on the Utilization and Conservation of Genetic Resources

The existence and utilization of genetic resources, including breeds comprised in the National Programme, is directly linked with the Czech Republic’s preparation to join the European Union, with the expected impact of production quotas and other regulated indicators (direct support etc.) on the overall size of animal production and the financial position of breeders. The already very low cattle populations are being further reduced as a result of the uncertainty concerning the extent and support of the production systems in different production areas. This situation is responsible for the hesitation as to whether to maintain or adjust the current large number of farmed and recently imported beef cattle and sheep breeds. The solution of these issues will undoubtedly lead to more intensive work with these populations many of which are kept in limited numbers and for the time being provide only partial information about the possibility of using them in particular localities.

The range of the farmed species and breeds will be influenced by future market demand, the agreed quotas and subsidies, the degree to which the domestic market will be opened up to European production and better export opportunities. Also the nutrition habits and demands of the domestic population and consumers from other ethnical groups, who will be coming to this country

as a result of the free movement of persons in the framework of the EU and new immigration waves will influence the market. Especially products, which are not in surplus in the EU (lamb, non-bovine dairy production), can be expected to have a good chance on the European market. As Czech legislation is being harmonized with EU law in advance, domestic production will have no problems meeting the required quality and hygienic standards. The enrichment of the market with quality meat will require the supply of meat products of a different breeding origin (cattle and sheep) and breeding technology (certified organic production). Similarly, alternative dairy products (from sheep and goats) will be increasingly demanded not only by the economically strong group of consumers. Probably another qualitative grade will be the production of so called “functional food” linked to concrete breeds or breeding technology.

There is growing pressure for organic farming linked with low input technologies, reflected, for example, by the wider use of the mixed cattle and sheep pasture farming technologies. For the time being these systems are nearly exclusively linked with the Romney Marsh and Aberdeen angus breeds. The verification of other suitable species and breeds may lead to greater possibilities of using also other genetic resources.

II.3. Future Plans for the Conservation and Utilization of Genetic Resources

The farming and conservation of breeds included in the National Programme, now and in future, is only possible thanks to the existing subsidies granted by the state. The relatively small size and the state of many of them as endangered populations called for different forms of their conservation and institutional backing. As part of the National Programme, a **genobank** has been set up at VÚŽV (cryoconserved blood samples, DNA and sperm insulators) of breeds included in genetic resources and other local breeds and populations. It serves especially for the purpose of genetic description and specific research the results of which are applied in sustainable development programmes and the utilization of breeds (casein and lactoglobulin polymorphism).



In addition to the VÚŽV genobank, a **National Cryobank** has been set up in the framework of the National Programme, the purpose of which is preserving spermatic doses and embryos on a long-term basis for future needs. The priority of the approved statute of the cryobank is the safe storage of the material. These activities will grow in importance especially in the near future. The breeders themselves and most professional breeders' associations and special-interest organizations, which ensure the registration and collection of data on the populations of genetic resources, make these activities conditional on financial support. Nor is other specialized work – molecular genetic analyses – possible without support. In future, the sufficient supply of cryoconserved genetic material will make it possible to reduce the need for funds to support individual animals and breeds in vivo.

More financial support from the state and other sources should go to the development of specific in situ conservation programmes and the strengthening of public awareness in this area. The first project to be prepared is the **genetic park** programme – teaching and genetic resources promotion farms of the SRAZ ecological association. This activity should start the implementation of a new concept of genetic resources promotion with the aim of addressing direct consumers (demand for specific production originating from local genetic resources) and/or sponsors (financial support). Other publicity and information programmes should also be used and further NGOs should be attracted.

The programme to use genetic resources is also supported by link-up research programmes subsidized by the National Grant Agency and is being incorporated in the curricula of schools. Scientific knowledge and research results are also applied in educational and consulting activities organized by institutions (research institutes) and agricultural universities and breeders' association in the form of courses, seminars, workshops and scientific conferences. These activities are also receiving financial support from the state.



Part III: State of National Capacities and Demand for Building Them

III. 1. Legislation and State Support

The state of knowledge concerning breeds kept in the country is on a good level thanks to current legislation and the ensuing state support. The legislative measures (chapter 1.2) are setting rules for the breeding and farming of farm animals in a way ensuring the use of methods, which are in agreement with international standards and commitments and are a guarantee of objective fact-finding and assessment for the use of farmers. With state support, these activities have become a tool for raising the genetic value and improving economic management and competitiveness of animal production.

The country's legislation provides for, and the appropriate bodies inspect, the protection of animals (Animal Protection Act), their health (Veterinary Act) and special regimes of utilization, e.g. the Organic Farming Act.

The state supports the genetic improvement of farm animals (by subsidizing yield control, the keeping of stud books, assessment and publication of results, organizing educational programmes). These subsidies go to the authorized entities ensuring these activities and to the farmers themselves.

III.2. State of National Capacities

The active use and development of the breeds of all kinds of farm animals in the Czech Republic is well organized and ensured thanks to the long-term and continuous policy of their improvement, which represents a permanent improvement progress. Selection and hybridization programmes comprise the monitoring of reproduction and production indicators and the estimate of breeding values by modern methods.



Act No. 154 stipulates and defines the duties and rights of authorized persons and breeders' associations to carry out the appropriate expert activities (yield control, keeping stud books, performance tests, assessment of the animals, insemination stations and insemination, embryo transfer etc.) and individual breeders and their associations and breeders' unions, with the aim of ensuring high-quality animal production. Authorized institutions keep their own databases and make decisions as to the breeding programmes. They are provided with the required computer equipment, which also applies to their field workers, who carry out expert activities and collect basic data directly in the farms. The data are passed on in electronic form and are kept on file for the prescribed period. From the databases of these institutions the data are sent to the database of the National Focal Point.

The breeders' unions ensure the way of utilizing the breeds and improving their genetic and use value. Breeders participate in this process directly through the different breed clubs in the framework of the unions, which autonomously determine the improvement programmes, while taking into account not only the immediate needs, but also future benefit. The reproduction techniques, such as insemination, embryotransfer, ultrasound diagnostics of reproduction and meatiness are used in practice for different species to a varying extent.

Genetic resources related issues also have the support and backing in scientific and research activities. In addition to VÚŽV, they are dealt with, to a varying extent, by Czech Agricultural Universities and South Bohemian Universities, as well as by specialized workplaces (Fisheries and Hydrobiological Research Institute, Institute of Animal Physiology and Genetics of the Czech Academy of Sciences, Apiary Research Institute), which are mainly concerned with the development of molecular-genetic methods and biotechnologies.

The testing of the qualitative characteristics of production is being gradually introduced in dairy (casein component content) and meat production (fattening capacity and carcass quality testing). Specific properties, such as resistance to disease and parasites, are not being monitored so far. The testing of the genetic



and molecular-genetic characteristics of breeds has begun in the framework of research projects whose output will be practical applications in improvement and breeding programmes. Part of this testing is the assessment of the economic weight of individual characteristics.

Part IV: Setting National Priorities

IV.1. Sustainability, Utilization and Conservation of Genetic Resources

The principal aim of agricultural policy in the Czech Republic is making the agrarian sector competitive in relation to the EU and the world, while maintaining agricultural activities on the largest possible area. In future, a certain diversification of agricultural activities is expected in connection with the country's joining the EU, and in this connection ever greater emphasis is being placed on the development of the non-production function and the sustainable and friendly utilization of rural areas. Intensive, but at the same ecologically friendly production is envisaged on approximately 50 per cent of total land resources (with intensity of up to 2 livestock units per hectare of fodder plants). Other functions of agriculture will include the maintenance of the countryside, renewal of biodiversity and the development of rural areas, all with the help of state-supported general services – research, veterinary medicine, genetic improvement and informatics. For these other functions of agriculture the utilization of farm animal biodiversity is most essential.

The overall arrangement of the conservation and utilization of farm animal genetic resources in the Czech Republic is on a satisfactory level thanks to existing legislation and the institutional backing ensuing from it. The National Programme subsidized by the state provides conditions for the future favourable development of this area. It would be more effective, however, if the entire National Programme could be contractually guaranteed by arrangements between the National Focal Point (VÚŽV) and breeders for longer periods of time, which would bring the need for the conservation of animal genetic resources to the greater attention of both breeders and the public.

Despite the financial support provided to breeding and utilization *in situ*, there are concerns that some breeds might be endangered as a result of the growing age of the breeders, as there is no simultaneous replacement by the younger



generation. This raises fears that the size of the breeds might not be maintained on a sufficient level and that this might have a negative impact on the adopted methodical procedures.

Considering the ascertained state of the utilization of genetic resources and the state of the national capacities, the National Focal Point has set the following priorities and has made the following recommendations:

The sustainable utilization of genetic resources with regard to the indicated needs and trends urgently requires financial aid and the first prerequisite for this is looking for new sources or possibilities of making better use of existing sources. It is desirable to gain greater support from private sectors, such as consumer associations and other non-profit organizations, whose participation in the process of conserving and utilizing biodiversity is so far minimal.

From the point of view of management new activities should be promoted simultaneously by both *in situ* and *ex situ (in vitro)* methods.

In the case of *in situ* methods:

- In the framework of the follow-up programmes for rural development and ecologization of agriculture it is desirable to support the use of less intensive populations, locally adapted breeds for alternative production.
- To support alternative ways of using genetic resources it is essential to focus on the study of such properties of the used breeds, which have not been fully clarified so far, such as resistance to locally important disease (parasites), suitability for the production of functional food etc.

In the case of *ex situ* methods:

- It is desirable to intensify the cryoconservation process and accelerate the process of gaining genetic material, as the ever more massive utilization of high input/high output systems increasingly endangers the less numerous populations with lower use value.
- For the process of conservation and utilization of genetic resources it is



desirable to broaden the range of stored genetic material, i.e. oocytes, stem cells and tissues, in addition to sperm doses and blood, or DNA.

- The current intensive development of genomics and biotechnology will help towards broadening *ex-situ* conservation possibilities, and consequently it is necessary to ensure the provision of the technical and expert capacities for their utilization.
- It is necessary to intensify the genetic description of conserved breeds.

An “early warning programme“ must be an inseparable part of management. In this sense, it is necessary to complete the conservation methods for individual breeds, i.e. to determine the minimum number of animals guaranteeing the conservation of the breed and measures to be introduced in case the size of the populations comes close to these numbers.

Part V: Proposing New Activities and Their International Linkage

Future global strategy will inevitably require close international co-operation, especially as regards scientific and research support of biodiversity conservation.

- It is necessary to maintain and strengthen the co-operation especially within regions sharing similar genetic resources (DAGENE etc.). Co-operation in the sense of specialization in activities, in which the different workplaces are already engaged (e.g. *VÚŽV concerns with the milk protein polyform system in cattle, goats and sheep and has sufficient capacity for increasing both the volume and methods of its analytical work*), would help accelerate genetic assessment. It would also contribute towards making genetic material more easily accessible for comparative testing. This aspect currently constitutes one of the obstacles to the better knowledge of our breeds.
- It is desirable to support broader research programmes linked with the utilization of the genetic diversity of breeds, for example by the comparative testing of different breeds in certain production systems or by looking for new properties of breeds, which could be used for nutrition or other non-nutrition purposes. Co-operation would again facilitate access to live animals for testing. Considering the expected climatic changes it would be desirable to enlarge the range of testing to include thermal load resistance.
- Also desirable would be the presentation and assessment of existing national programmes, i.e. their methodology and effectiveness to allow the further enlargement of successful procedures. (*The National Programme of the Czech Republic, which has been developing since 1994, can offer a wide range of information and subjects in this respect*).
- Absolutely essential is the creation of compatible national information systems, which could be much better used and could thus accelerate the individual activities of the particular countries.



Part VI: Description of the Way the Report with Annexes Were Prepared

VI.1. Preparation of the Report

On the basis of the FAO recommendation and in accordance with the proposed procedure, the National Focal Point prepared a set of questions for the Genetic Resources Council e.g. for individual breed guarantors. These questions were then specified for each kind of farm animal and were tackled by a larger group of experts, led by the guarantor concerned and comprising representatives of breeders' unions, schools, independent experts and farmers (National Consulting Committee). The individual chapters were formulated on the basis of these questionnaires.

The answers were continuously specified through individual consultations and worked by the National Focal Point into a working version, based on working background questions (FAO – Annex 1). The working version of the report was discussed by the National Focal Point, and after the incorporation of the comments it was submitted to the Ministry of Agriculture for discussion followed by the formulating advanced version of the report. That was discussed by the Genetic Resources Council again to formulate the final version.

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VI.2. Executive Summary

In response to social demand and in connection with existing production systems, 17 local and on a long-term basis adapted breeds of cattle, horses, sheep and goats, pigs, poultry, rabbits and nutrias are used in the Czech Republic for agricultural purposes. Another imported breeds are used both in thoroughbred form and for hybridization. The state ensures the use and conservation of local and adapted species and populations in the National Programme for the Use and Conservation of the Genetic Resources of Farm Animals, Fishes and Bees.

The active utilization and development of the breeds of all farm animal species are well organized and ensured in the Czech Republic thanks to the long history and continuous policy of their improvement, which has resulted in a permanent improvement progress. Selection and hybridization programmes are the responsibility of the breeders' unions concerned and comprise the monitoring of reproduction and production indicators and breeding value estimates by modern methods. These activities are carried out by staffs having adequate expertise and technical equipment and are supported by a scientific and research programme reflected in projects tackled by research institutes and agricultural universities. This also applies to the species and breeds in the National Programme.

The state of knowledge about the farmed breeds is on a good level thanks to the country's legislation and the ensuing state support. The Act on Breeding sets the rules for the breeding and farming of farm animals so as to ensure the use of methods meeting international standards and commitments and is a guarantee of objective ascertaining and assessment for the needs of breeders. With state support, these activities are an instrument of improving the genetic value, economy and competitiveness of animal production. The country's legislation provides for the protection of animals (Animals Protection Act) and their health (Veterinary Act), inspected by the appropriate bodies, and there are special regimes of use, stipulated, for example, by the Organic Farming Act.



The pressure of the market and globalization lead to the gradual substitution of original breeds and populations by new, high input/high output breeds, thus endangering the existence of local breeds. Reflecting this situation, legislation was passed in 1992, which defined the term of gene reserves, and in agreement with the Biological Diversity Convention the National Programme for the Conservation, Use and Development of Genetic Resources was founded in 1993, favoured and financially supported by the state. Its principles are laid down in the amendment to Act 154 passed in the year 2000.

Future trends in agriculture characterized by the diversification of farming, conservation of biodiversity, development of the non-production functions and sustainable and friendly utilization of rural areas provide a chance to both highly productive, globally dispersed breeds and species, and to breeds suitable for low-input systems. Their choice will be highly specialized depending on concrete natural and production conditions. With growing market demand, the production of alternative and functional food will increase. All suitable breeds covered by the National Programme will be used for this purpose.

At the same time it is necessary to extend research to cover other specific properties of species and breeds that will enable the diversification of their utilization and the finding of completely new ways of their use. This is not possible without close international co-operation, at least on the level of regions sharing the same or originally related breeds and species.

The farming of species and breeds serving non-alimentary purposes (maintenance of grasslands, landscaping, sporting, relaxation and therapeutical activities) will depend on the assessment of their functions, and possibly on subsidizing them. There is increasing public awareness of the importance of this production and biodiversity. For this purpose, it will be necessary to gain the support of the private (non-profit) sector, and possibly to re-organize existing financial flows to ensure that a certain part of sources flowing from the sectors of trade, food production, manufacturing, the environment and regional



development go to the benefit of the biodiversity development programme. This will be a long-term process, and to maintain existing diversity it is therefore necessary to intensify the use of *ex situ (in vitro)* methods as soon as possible.

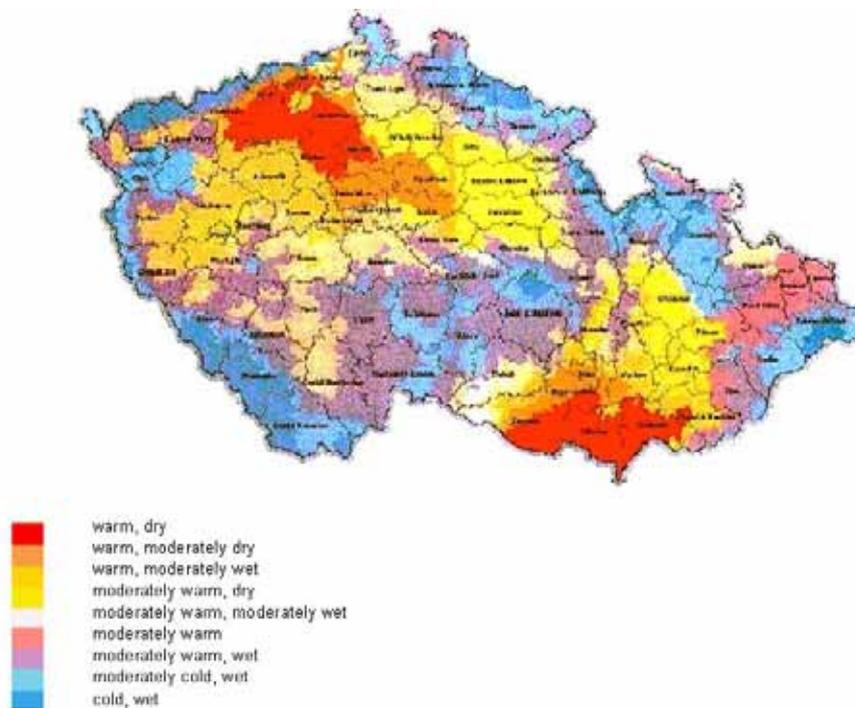
The intensive development of genomics and biotechnologies must also be taken into account, as they can contribute to the better utilization of conserved material (cloning, transgenesis). For this purpose, it is necessary to provide the necessary technical resources (laboratory and field equipment) and ensure expert knowledge for their utilization (human resources) well in advance.

VI.3 Annexes

VI.3.1. Map of the Czech Republic – situation map of Central Europe



V.3.1b) Map of the Czech Republic – climatic regions



V.3.2. Survey of Breeds Included in the National Programme



The Bohemian red – until the middle of last century it was registered as an autochthonous breed in different varieties (Lišňany red, Cheb red, etc.), i.e. before the completion of the unification of Simental-type cattle. For teaching purposes, agricultural universities maintain several dozen head in breeding, but the breed, especially for lack of breeding bulls, is classified as endangered. To solve the

problem, the sperm of German and Polish reds is used, and efforts to reconstruct the breed by the transfer crossing of Bohemien red-pied breeding cows with the semen of the Bohemian red are continuing. (Bohemian red-pied cattle came into being by the conversion crossing of reds, and is related with them also according to DNA information.)



The Bohemian red-pied cattle is included in the National Programme, because thanks to existing information about the pedigrees of individual animals, the cryoconserved material of individuals of the original unified simental-type breed can be used for future needs.



The Přeštice black-pied pig is an original local breed with outstanding reproduction performance, adaptability, rather easy care and resistance. After 1945 this population was influenced by the

use of different breeds of boars, especially the German and English saddle pig, its regeneration later led to its recognition as a separate breed in 1964. Today, it is kept as a closed population with approximately 350 breeding sows and 30-40 breeding boars.



The Old-Kladruby horse is a warm-blood breed, based on old-Spanish and old-Italian blood, which has been bred in the Czech Republic continuously for more than 400 years. This breed has been in 1995 recognized as a national

cultural heritage. It is kept in the Kladruby National Stud Farm, where 125 mares of both varieties are bred and improved, about the same number of mares are bred elsewhere in the country. In 2002, the herd of the old-Kladruby whites bred in the Kladruby National Stud Farm was declared a national cultural heritage.



The Silesian norik was bred as a cold-blood horse of Silesian origin. Approximately 250 head of this breed were registered in 1991. It is a population formed some 100 years ago on the basis of noriks imported from Austria and Bavaria combined with mares of Silesian origin. The present active breeding population has a certain proportion of genes of the original type of horses and totals 23 stallions and 120 mares,

and is therefore an endangered population. The mares are held by private breeders, and most of the stallions are held by several national stud farms. The breed's improvement programme is aimed at limiting the growth of the coefficient of inbreeding.



The Bohemian-Moravian Belgian horse is a cold-blood horse based on the import of Belgian (1880 – 1930) and to a lesser extent Walloon (1880 – 1910) stallions and domestically bred mares; no further immigration of Belgian stallions has occurred for the past 60 years. Of the total population

of some 740 mares and 40 stallions, 188 mares and 29 stallions have been included in the genetic resource (2001).



The Hucul horse, originating in the Carpathians, has been bred in the Czech Republic on a long-term basis. Currently its breed comprises 290 mares and 31 stallions, but not all are of equal genetic quality. Altogether 180 mares and 19 stallions have been included in the genetic

resources according to pedigree records. The improvement programme is carried out by pureblood breeding in the framework of the closed population.



Šumava sheep Shumavka

probably an original rustic sheep, farmed in the Šumava area on a long-term basis. The programme for its regeneration was launched in the 1950s; in 1986 it was recognized as a separate breed. Currently

the breed comprises some 2000 head.



In 1999, another breed, the **Valachian sheep**, specifically 45 ewes and 2 rams, were included in the National Programme, followed in 2001 by several more animals farmed on a small-scale, until then supported by the Pro Specie Rara foundation. The current population comprises some 130 ewes and yearlings and 11 rams. Their number is on the verge of an endangered breed, and there are efforts to increase this number.



Both **goat** breeds (**White and Brown short-haired g.**) came into being at the end of the 19th century. They were created by the cross-breeding of the original rustic goat with the imported Saanen and Harz breeds. Imports of the white goat breed from Germany lasted until the 1980s. The purpose of their inclusion in the country's genetic

resources was to prevent uncontrolled cross-breeding and imminent close breeding. In 2002, molecular genetic analyses of the goats revealed the presence of alela C in the capa-casein locus, which has not been described in the European population so far, together with a distinct dissimilarity of the two breeds in this locus. In the brown goat which was



until the end of the 1980s kept in the limited region of the northern and north-western border region, another reason for its inclusion in genetic resources was the critical decline in its population (173 head in 1994). The aim is to raise its population to at least 1000 heads.



Bohemian gold speckled hen.

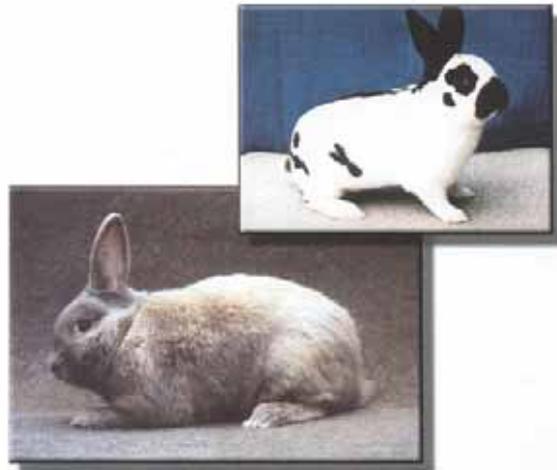
It is kept in flocks with individual yield recording and pedigree hatching involving approximately 70 hens and 18 cocks in batches and 220 hens with individual yield control. Other breeders also keep this breed without individual yield

control. About 150 hens and 20 cocks are bred in an international poultry testing station. The population of the original domestic breed of the **Bohemian goose** recognized in the 1930s as a separate breed based on the original domestic goose is formed by geese and ganders kept on 23 private farms with individual recording and pedigree hatching involving about 160 geese and 40 ganders. Another 50 geese and 20 ganders are tested for the meat yield of the progeny at an international poultry testing station.



Incorporated in the National Programme are 7 rabbit breeds and 3 coypu breeds. The rabbits are the cultivated original Bohemian breeds of the **Bohemian lofer and Moravian blue**, in nutrias, besides the standard type, also include the

Silver and the Přeštice type. The numerical representation of rabbits of the remaining 5 local breeds is continuously decreasing, despite the subsidy granted to them, and their wider regeneration is critically endangered. A very similar situation exists in the nutria population, although in former Czechoslovakia their annual production was nearly half a million skins. As from 2001, all nutrias included in genetic resources are marked by chips enabling their individual monitoring.



Altogether 9 different kinds of fish breeds and populations (**common carp, common tench, rainbow trout, common brook trout, sheatfish, whitefish, maraena and sturgeon**) are bred as genetic resources in 47 stem shoals of 60 female and 60 male individuals each. The main methodical principles include individual marking and recording by microchips and keeping a central database of breeders and fishes in the particular shoals. In situ breeding takes place in two separate localities. Sperm cryoconservation is carried out alongside in situ fish breeding.





In 1996, the **Carniolan honey bee** was included in the National Programme. In 1970, the Czech Beekeepers' Union adopted the bee as a conceptually important breed. A condition is ensuring the existence of a strong breeding base supplying bee-keepers with inseminated mother bees of the

required properties. More than 50,000 bee-keepers are registered in the Czech Republic, with 500 000 bee colonies. The breeding honey bee according to the proposed programme is very important, as there is no reserve population of this bee available in any other country. The conservation programme by the in situ method is possible thanks to excellent insemination facility, the use of the mothers and their daughters in 42 different localities totalling 1619 breeding bee colonies with records of their origin and with use control.

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