



REPUBLIKA SLOVENIA
MINISTRSTVO ZA KMETIJSTVO, GOZDARSTVO IN PREHRANO
REPUBLIC OF SLOVENIA
MINISTRY OF AGRICULTURE, FORESTRY AND FOOD



Univerza v Ljubljani
Biotehniška fakulteta
Oddelek za zootehniko

University of Ljubljana
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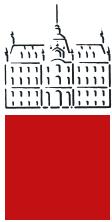
STANJE ŽIVALSKIH GENSKIH VIROV V SLOVENSKEM KMETIJSTVU



THE STATE OF FARM ANIMAL GENETIC RESOURCES IN SLOVENIA



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FOREWORD

The Food and Agriculture Organisation of the United Nations has for several years encouraged all countries in the world to conserve genetic resources that are of relevance to food and agriculture. This is one of the realistic possibilities for solving major problems in the world, such as poverty and famine. Even today, every sixth inhabitant of the Earth, among whom there are millions of children, does not have enough daily bread. Similarly to the Rome Declaration from 1996, also the Declaration Five Years Later from 2002 promotes national production of the major share of the required food, a search for better technologies that would be better suited to the local situation and based on the principles of sustainable development, as well as improved competence and education. People have to be taught how to guarantee themselves a better future and independence.

The basic biological capital needed for the development of livestock production, food security of people, and sustainable development of rural areas, are breeds of a few domesticated animal species. The value of the greater part of these animal genetic resources is poorly known. In the last decades of the previous century, development around the world focused on rearing a small number of breeds, often without taking into consideration their natural capacity for survival, reproduction and breeding under local conditions. In 2000, the FAO announced that each week two species of domestic animals extinct, which means that precious biological diversity is being lost. After a decade-long research performed in 170 countries around the world, data was collected for 6500 breeds of domestic mammals and poultry. It was established that approximately one thousand domestic animal breeds were lost during the past century, and that one third of them are faced with extinction, numerous being on the verge. All this provided additional incentive for the world-wide State of the World's Animal Genetic Resources project, joined by 139 countries from all continents, including Slovenia. The purpose of the project is not stock-taking, but draf-

ting an action plan for the conservation of animal genetic resources relevant for the food and agriculture of each country, as well as a comprehensive plan for individual areas and the world as a whole.

In Slovenia, livestock production is the most important agricultural discipline. In the study before you, the state of the animal genetic resources in the Slovene agriculture is presented in detail and from several aspects. The plan for the conservation of animal genetic resources in Slovenia can be summarised in seven national priorities: to stop overgrowing of agricultural land, to form a strategy for sustainable food supply, to use environment- and animal-friendly breeding technologies, to preserve biological diversity in livestock production, to utilize animal genetic resources (more attention should be accorded to critical areas), to implement the national policy in livestock production, and to modernise the national livestock production infrastructure. I am convinced that achieving the proposed priorities would make a significant contribution to the conservation of animal genetic resources in Slovene agriculture, to a better and higher quality supply of foodstuffs of animal origin, and to the conservation of the Slovene landscape. The Ministry of Agriculture, Forestry and Food of the Republic of Slovenia will include the proposed national priorities in its strategy for development. Concern for the conservation of animal genetic resources is also manifested in the fact that the Republic of Slovenia devotes a special chapter of its Livestock Breeding Act to the »Conservation of the genetic variability and genetic reserves of farm animals«, and that it has adopted a seven-year programme »Conservation of biodiversity in animal husbandry in Slovenia«.

I would like to thank the expert working group on animal genetic resources for its high-quality work, which represents an immense contribution to the Slovenian livestock production development.

*Franc But, M.Sc.
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of the Republic of Slovenia*

PREDGOVOR

Organizacija Združenih narodov za prehrano in kmetijstvo (FAO) že vrsto let spodbuja vse države sveta tudi k ohranjanju genskih virov, pomembnih za prehrano in kmetijstvo. V tem je ena od realnih možnosti za rešitev hudih težav sveta, kot sta revščina in lakota. Še vedno vsak šesti zemljan, med njimi so milijoni otrok, nima dovolj vsakdanjega kruha. Podobno kot Rimska deklaracija iz leta 1996 tudi deklaracija Five years later iz leta 2002 spodbuja k lastni pridelavi večine potrebne hrane, iskanju boljših tehnologij, primernih za krajevne razmere in zasnovanih na načelih trajnostnega razvoja, in k večji usposobljenosti ter izobraženosti. Ljudi je treba naučiti, kako si bodo sami zagotovili boljšo prihodnost in neodvisnost.

Osnovni biološki kapital, potreben za razvoj živinoreje, prehransko varnost ljudi in trajnostni razvoj podeželja, so pasme sicer maloštevilnih udomačenih živalskih vrst. Vrednost velike večine teh živalskih genskih virov je slabo poznana. Po vsem svetu se je razvoj v zadnjih desetletjih prejšnjega stoletja osredotočil na rejo maloštevilnih pasem, pogosto brez upoštevanja njihovih naravnih sposobnosti za preživetje, razmnoževanje in rejo, prilagojeno krajevnim razmeram. FAO je v letu 2000 sporočil, da vsak teden izumreta dve pasmi domačih živali, zaradi česar izgubljamo dragoceno biotsko raznovrstnost. Po desetih letih raziskovanja v 170 državah sveta so zbrali podatke za 6500 pasem domačih sesalcev in perutnine. Ugotovljeno je bilo, da smo v zadnjih 100 letih izgubili okoli 1000 pasem domačih živali in da tretjina pasem domačih živali izumira, številne pa so tik pred izumrtjem. Vse to je bilo še dodatna spodbuda za svetovni projekt State of the World's Animal Genetic Resources, v katerega se je vključilo 139 držav z vseh celin, med njimi tudi Slovenija. Namen projekta ni pregled stanja,

ampak izdelava akcijskega načrta za ohranjanje živalskih genskih virov, pomembnih za prehrano in kmetijstvo vsake države, ter globalnega načrta za posamezna področja in svet kot celoto.

V Sloveniji je živinoreja najpomembnejša kmetijska panoga. V študiji, ki je pred vami, je podrobno in vsestransko predstavljeno stanje živalskih genskih virov v slovenskem kmetijstvu. Načrt za ohranjanje živalskih genskih virov v Sloveniji je povzet v sedmih nacionalnih prednostnih nalogah: ustavitev zaraščanja kmetijskih površin, strategija trajnostne oskrbe s hrano, okolju in živalim prijazne tehnologije reje, ohranjanje biotske raznovrstnosti v živinoreji, izkoriščanje živalskih genskih virov (večjo pozornost je treba nameniti kritičnim področjem), izvajanje nacionalne politike v živinoreji in posodobitev nacionalne infrastrukture v živinoreji. Prepričan sem, da bo z izpolnitvijo predlaganih prednostnih nalog mogoče veliko prispevati k ohranitvi živalskih genskih virov v slovenskem kmetijstvu, k boljši in kakovostnejši oskrbi z živili živalskega izvora ter k ohranitvi slovenske krajine. Ministrstvo za kmetijstvo, gozdarstvo in prehrano Republike Slovenije bo predlagane nacionalne prednostne naloge vključilo v svojo razvojno strategijo. Skrb za ohranjanje živalskih genskih virov se kaže tudi v tem, da ima Republika Slovenija v Zakonu o živinoreji posebno poglavje Ohranjanje genetske variabilnosti in genetske rezerve domačih živali ter sprejet sedemletni program Ohranjanje biotske raznovrstnosti v živinoreji v Sloveniji.

Zahvaljujem se strokovni delovni skupini za živalske genske vire, ki je s kakovostno opravljenim delom pripomogla k razvoju slovenske živinorejske stroke.

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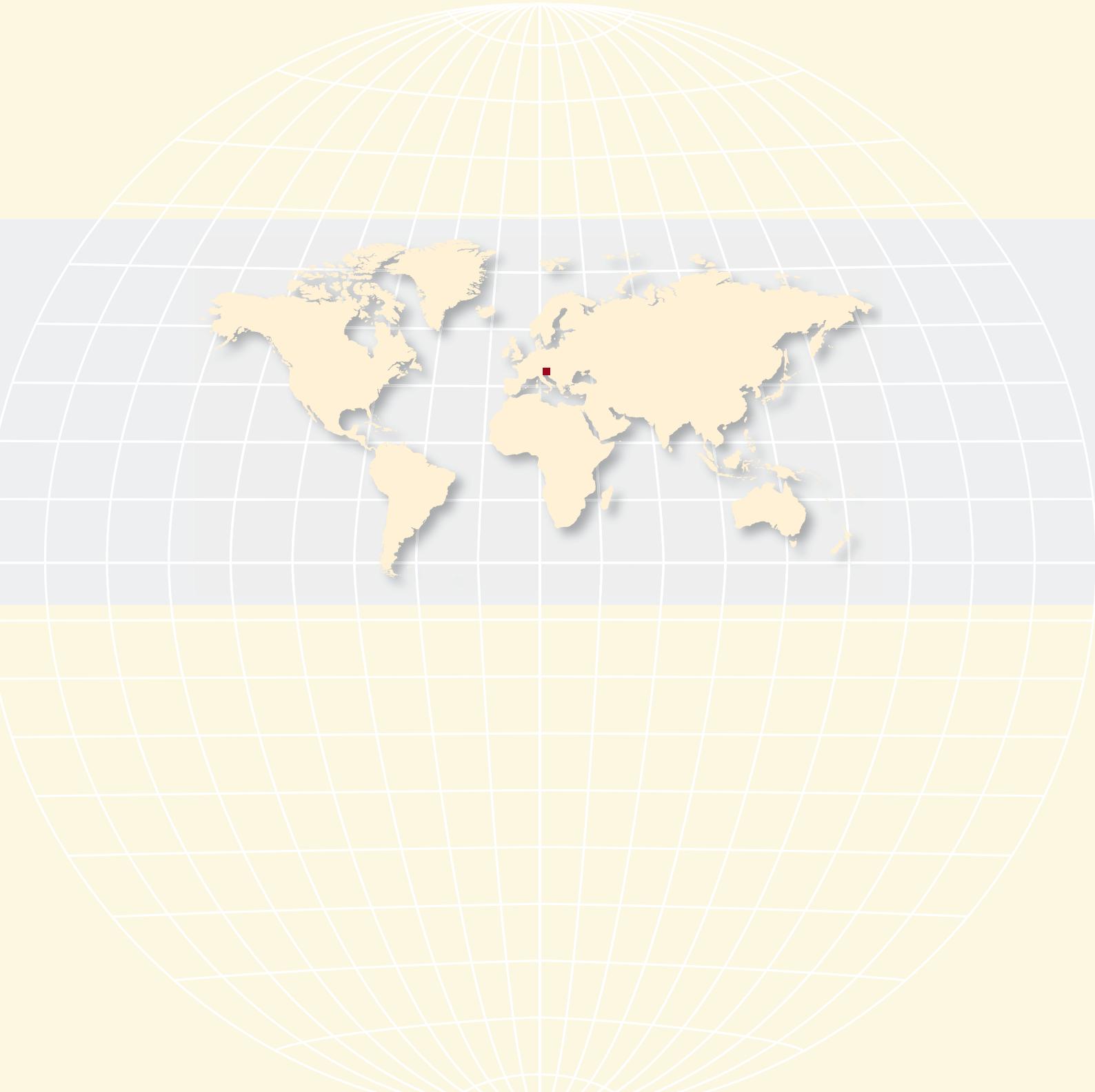
KRATICE

AGDB	Banka genskih podatkov za domače živali
APIIS	Računalniškemu okolju prilagodljiv neodvisen informacijski sistem
BSE	Bovine spongiform encephalopathy
DAD-IS	Informacijski sistem raznovrstnosti domačih živali
DAGENE	Združenje podonavskih držav za ohranjanje genov pri živalskih vrstah
DNA	Deoksiribonukleinska kislina
EAAP	Evropsko združenje za živinorejo
ET	Prenos zarodkov
EU	Evropska unija
EUR	Evro
FAO	Organizacija Združenih narodov za prehrano in kmetijstvo
ICAR	Mednarodni komite za kontrolo živali
IDF	Mednarodni komite za mlekarstvo
ISAG	Mednarodno združenje živalske genetike
KMG-MID	Identifikacijska številka kmetijskega gospodarstva
KZU	Kmetijska zemljišča v uporabi
MKGP	Ministrstvo za kmetijstvo, gozdarstvo in prehrano
PDM	Polnovredna delovna moč
PV	Plemenska vrednost
RS	Republika Slovenija
SAVE	Zaščita kmetijske raznovrstnosti v Evropi
SIR	Služba za identifikacijo in registracijo živali
SKOP	Slovenski kmetijsko okoljski program
SURS	Statistični urad Republike Slovenije
UO	Osemenjevanje
ŽGV	Živalski genski viri

ABBREVIATIONS

AGDB	Animal Genetic Data Bank
AI	Artificial Insemination
AnGR	Animal Genetic Resources
APIIS	Adaptable Platform Independent Information System
AWU	Annual Work Unit
BSE	Bovine Spongiform Encephalopathy
BV	Breeding Value
DAD-IS	Domestic Animals Diversity - Information system
DAGENE	Danubian Countries Alliance for Gene Conservation in Animal Species
DNA	Deoxyribonucleic acid
EAAP	European Association for Animal Production
ET	Embryo transfer
EU	European Union
EUR	Euro
FAO	Food and Agriculture Organization of the United Nations
FIM	Farm identification number
ICAR	International Committee for Animal Recording
IDF	The International Dairy Federation
ISAG	International Society of Animal Genetics
MAFF	Ministry of Agriculture, Forestry and Food
RS	Republic of Slovenia
SAEP	Slovenian Agro-Environmental Programme
SAVE	Safeguard for Agricultural Varieties in Europe
SIR	Service for Identification and Registration
SORS	Statistical Office of the Republic of Slovenia
UAA	Utilised agricultural area

SLOVENIJA IN NJEN KMETIJSKI SEKTOR



SLOVENIA AND ITS AGRICULTURAL SECTOR

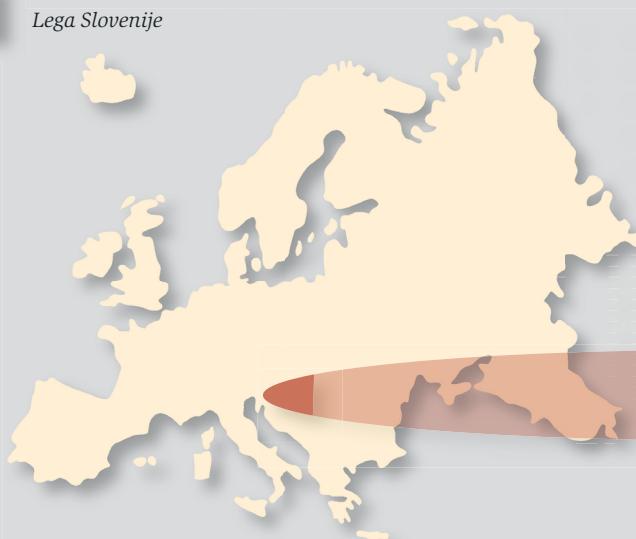
VELIKOST IN LEGA DRŽAVE

Slovenija je izrazito tranzitna srednjeevropska država, ki leži na pomembnem prometnem prehodu z območja Alp proti Balkanu oziroma iz Podonavja proti Sredozemlju. Strateška lega na stičišču treh velikih evropskih kultur - germanske, romanske in slovanske - je pomembno vplivala na njen politični, gospodarski in kulturni razvoj.

1

Slika / Figure

Lega Slovenije



SIZE AND LOCATION OF THE COUNTRY

Slovenia is a distinctively Central European country, located at an important crossing between the Alps and the Balkan region, and between the Danubian basin and the Mediterranean Sea. The strategic position at the intersection of the three great European cultures - Germanic, Romanic, and Slavic - has had an essential impact on its political, economic, and cultural development.

Geographical position of Slovenia



Slovenija je ena najmanjših evropskih držav s skupno površino 20 273 km², od katere je po uradnih statističnih podatkih gozda 56,5 %, kmetijskih površin 38 % (kmetijskih površin v uporabi 25,5 %), voda 0,6 %, skal 1,8 %, urbaniziranih površin (pozidane površine, ceste, železnice) 3 % in neopredeljenih površin 0,1 % (preglednica 1).

1

Preglednica / Table

Parameter	Vrednost
Površina [km ²] Surface area [km ²]	20 273
Število prebivalcev Population	1 990 272
Gostota prebivalstva [štev./km ²] Population density per km ²	98
Delež gozdnih površin [%] Share of forest land [%]	56,5
Delež kmetijskih površin [%] Share of agricultural area [%]	38
Delež kmetijskih površin v uporabi [%] Share of utilized agricultural area [%]	25,5

Slovenia, one of the smallest European countries, covers a total of 20,273 km². According to official statistical data, forest and woodlands cover as much as 56.5 % of the surface, and agricultural lands only 38 % (utilized agricultural area is 25.5 %). Other categories are aquatic surfaces (0.6 %), rocky lands (1.8 %), urban areas (buildings, roads, railways) (3 %), and unclassified areas (0.1 %) (Table 1).

Osnovni statistični podatki (leto 2000) Some basic statistical data (2000)

CLIMATIC AND GEOGRAPHICAL FEATURES

Slovenian territory is at the hub of four major European landscape units: the Alps, the Pannonian plain, the Dinaric Alps, and the Mediterranean Sea. In this small area one can experience various types of landscape and climate. Within a distance of 50 km, there are the sea, the limestone regions of karst and the alpine highlands. Slovenia lies at the meeting point of the Mediterranean and continental climate of Central Europe. Due to the marked variety of landforms, considerable differences in precipitation and temperature occur between the Littoral (submediterranean) area (Portorož), alpine area (Kredarica), central area (Ljubljana), and sub-pannonian area (Murska Sobota) (Appendix B1). The diverse natural conditions are reflected in the ways the land is exploited. Of the total Slovenian area, more than half is covered by forest, which makes Slovenia one of the most forested countries in Europe.

HUMAN POPULATION AND TRENDS

The demographic structure of the Slovenian population is relatively stable. Population growth has slowed down since 1981 because of a decline in natural increase and a reduction in immigration. The share of active population is almost 50 %. As the number of inhabitants living in agricultural households (only 16.2 % in 2000 compared with 21.5 % in 1991) and the number of those whose main source of income comes from agricultural activities (less than 3 % in 2000) decreases, the number of those employed in secondary and other services is increasing. Both the age structure and employment structure show a relatively fast transition from a typical agricultural economy towards a developed industrial society. The share of population living in rural areas is approximately 50 % and is stable.

DESCRIPTION OF THE AGRICULTURAL SECTOR

The most important sector of agriculture is livestock production. It contributes about two thirds of the final value of agricultural output, and according to the

PODNEBNE IN ZEMLJEPISNE ZNAČILNOSTI

Ozemlje Slovenije leži na obrobju štirih velikih pokrajinskih enot: Alp, Panonske nižine, Dinarskega gorstva in Sredozemskega morja. Na majhni površini se hitro spremojata videz krajine in podnebje, saj se na dobroih 50 km zračne razdalje izmenjavajo kras, visokogorje in morje. Slovenija leži na prehodu med sredozemskim in celinskim podnebjem srednje Evrope. Zaradi izrazite reliefne razčlenjenosti se pojavljajo velike razlike v prostorski razporeditvi padavin in temperatur med obmorskим (submediteranskim) območjem (Portorož), alpskim (Kredarica), osrednjim (Ljubljana) in subpanonskim območjem (Murska Sobota) (priloga B1). Pestre naravne razmere se kažejo tudi v strukturi rabe zemljišč. Z več kot polovico celotnega ozemlja, poraslega z gozdom, spada Slovenija med najbolj gozdne države v Evropi.

PREBIVALSTVO IN DEMOGRAFSKA GIBANJA

Demografska sestava prebivalstva v Sloveniji je razmeroma nespremenljiva. V glavnem enakomerna rast prebivalstva se je po letu 1981 upočasnila predvsem zaradi zmanjšanega naravnega prirastka in zmanjšanja priseliteljev v državo. Delež aktivnega prebivalstva se giblje blizu 50 %. Ob zmanjševanju deleža prebivalstva, ki živi na kmetijah (v letu 2000 le še 16,2 % v primerjavi z 21,5 % v letu 1991), in zmanjševanju deleža tistih, katerih glavni vir dohodka izvira iz kmetijstva (v letu 2000 že manj kot 3 %), se povečuje delež zaposlenih v sekundarnih in drugih dejavnostih. Starostna in zaposlitvena sestava prebivalstva kažeeta, da je Slovenija razmeroma hitro prešla iz klasične kmetijske v razvito industrijsko državo. Delež prebivalstva, ki živi na podeželju, se bistveno ne spreminja in se giblje okoli 50 %.

OPIS KMETIJSKEGA SEKTORJA

Najpomembnejša panoga kmetijstva je živinoreja, ki prispeva okoli 2/3 celotne vrednosti končne kmetijske proizvodnje, po podatkih nacionalnih računov pa okoli

polovico bruto domačega proizvoda kmetijstva. Med živinorejskimi panogami so gospodarsko najpomembnejše govedoreja, prašičereja in perutninarnstvo. Tudi druge panoge živinoreje prispevajo vsaka svoj delež, ki je z ozko gospodarskega in nacionalnega vidika mogoče manj pomemben, a pogosto nenačomestljiv za posamezno kmetijsko gospodarstvo in ohranitev narodnega bogastva v kmetijskem prostoru. Podobno velja tudi za rastlinsko pridelavo, ki zaradi prevladujočih izrazito neugodnih naravnih danosti le v majhnem deležu dosega mednarodno konkurenčnost. Zaradi takšnih razmer Slovenija vidi svoje možnosti predvsem v pridelavi kakovostne in zdrave hrane. Najpomembnejši osnovni kmetijski proizvodi so meso, mleko, jajca, žita, sadje, grozdje in vrtnine.

Pomen kmetijstva pa je bistveno večji, kot ga lahko zajamemo zgolj z vrednostjo kmetijske proizvodnje v nacionalnih statistikah, saj ima kmetijstvo v Sloveniji izrazito večfunkcionalno vlogo.

V Sloveniji imamo po katastru okoli 880 000 ha kmetijske zemlje, vendar je v uporabi po podatkih Statističnega urada Republike Slovenije (SURS) le dobrih 500 000 ha, pa še ta pretežno ni najprimernejša za obdelavo. Njivskih površin je le dobrih 170 000 ha, skoraj 80 % kmetijskih zemljišč v uporabi (KZU) pa leži na območjih z omejenimi dejavniki za kmetijsko pridelavo, če uporabimo merila, kakršna veljajo v EU. Pereče vprašanje je zaraščanje kmetijskih zemljišč, iz česar tudi izhaja največja razlika med podatki katastra in dejansko rabo zemljišč. Slovenski kmetijski okoljski program (SKOP) uvaja nekatere ukrepe proti zaraščanju kmetijskih površin.

Prevladujejo družinske kmetije, kar še posebno izrazito velja za govedorejo kot najpomembnejšo panogo živinoreje, pa tudi za rejo drobnice. Pomemben delež prieje, ki ne izvira iz družinskih kmetij, je le pri prašičereji in perutninarnstvu.

Za Slovenijo je značilna izrazito majhna velikostna sestava kmetij. Kar 27 % kmetijskih gospodarstev ima manj kot 2 ha KZU, 7/8 gospodarstev pa ne dosegajo 10 ha KZU. Mejo 50 ha KZU presega le 0,2 % kmetijskih gospodarstev. Spreminja se velikostna sestava živinorejske prieje, povečuje se koncentracija tržne prieje, povečujeta se tudi specializacija in raznovrstnost sistemov reje, vendar ostajata povprečna velikost in intenzivnost prieje še vedno majhni (značilno predvsem za govedorejo). Povečujeta se tudi okoljska in etološka ozaveščenost rejcev in družbe v celoti.

Za delovno silo na kmetijah nimamo ločenih podatkov za živinorejo. Ugotavljamo, da od skupno 107 809 polnovrednih delovnih moči (PDM), zaposlenih v kmetijstvu, glede na sestavo končne vrednosti kmetijske proizvodnje okoli 70 % vloženega dela odpade na živinorejo. Velik delež vloženega dela prispevajo osebe,

national economic accounts it represents about half of the agricultural gross domestic product. Cattle, pigs and poultry are the most important livestock sectors. Although other livestock sectors may be of lesser economic importance at the national level, their role on individual agricultural holdings and in the conservation of national resources provided by the rural area is of exceptional significance. This holds true for plant production, too, which can be competitive on international markets to only a limited extent, due to prevailing unfavourable natural conditions. Slovenia therefore perceives its opportunities particularly in the production of high quality health food. The most important agricultural commodities are meat, milk, eggs, cereals, wine-grapes, and vegetables. Agriculture in Slovenia has a multi-functional role and, as such, its significance exceeds the value of agricultural production provided by national statistics.

According to the cadastral register, there are 880,000 ha of agricultural land in Slovenia; however, only 500,000 ha are utilized, as reported by the Statistical Office of the Republic of Slovenia (SORS); in addition, this land is not very suitable for farming. Only 170,000 ha are arable. Almost 80 % of land under cultivation lies in regions with unfavourable conditions for agricultural production according to the EU less favoured areas classification criteria. Overgrowing of agricultural land is a serious problem and probably causes the differences in the data presented in the cadastral register and the actual use of land. The Slovenian agro-environmental program is thus introducing some measures to limit further reduction of cultivated land.

The family farms prevail in the Slovenian farming structure. This holds especially in cattle production, as the most important livestock sector, as well as in small ruminant production. The only significant share in livestock production that does not originate from family farms can be found in the pig and poultry sectors.

Slovenian agriculture is characterized by a small farm structure. As many as 27 % of agricultural households utilise less than two ha of agricultural land, and 7/8 of households less than 10 ha. Only 0.2 % of farms exceed 50 ha. The structure of livestock production is changing. The proportion and concentration of commercial production is growing, together with specialization and diversification. Nevertheless, the average size remains small and the intensity low, especially in cattle production. Environmental and ethological awareness of breeders and society as a whole is also increasing.

National statistics do not collect separate data of labour employed in livestock production. Out of 107,809 annual working units (AWU) employed in agriculture - considering the structure of final value of agricultural production - some 70 % of labour input can be attributed to livestock production. An important share of labour input is provided by persons for whom agricultural production is neither the only nor

the principal source of income, or by persons who are formally retired.

An important challenge for the future development of agriculture in Slovenia is the very low level of education of those employed in farming, and their age structure. More detailed information can be obtained only for farm holders. The 2000 census shows that 59 % of farm holders have either primary school education only, or have no formal education whatsoever; 38 % of farm holders have completed vocational or secondary education. Only 15 % of holders have completed one of the agricultural education programs, while 84 % have practical experience only and no professional training. The data on younger holders and successors -future holders are relatively favourable. The mean age of holders in 2000 was 56.7 years. The share of those older than 65 is high. They represent as many as 32 % of farm holders on family farms.

za katere kmetijstvo ni edini niti glavni vir dohodka ali pa so formalno že upokojene.

Pomembno razvojno vprašanje je izredno nizka splošna in poklicna izobrazba zaposlenih v kmetijstvu, pa tudi njihova starostna sestava. Z natančnejšimi podatki razpolagamo le za gospodarje na kmetijah. Po podatkih iz leta 2000 ima 59 % gospodarjev končano le osnovno šolo ali pa je brez formalne izobrazbe, 38 % gospodarjev pa ima končano poklicno ali srednješolsko izobrazbo. Vendar je le 15 % gospodarjev končalo vsaj enega od programov kmetijskega izobraževanja, 84 % pa jih ima po podatkih popisa zgolj praktične izkušnje. Razmeroma ugodni so podatki za mlajše gospodarje in naslednike - prihodnje prevzemnike kmetij. V letu 2000 je bila povprečna starost gospodarjev 56,7 leta. Velik je tudi delež starejših od 65 let, saj ti zavzemajo kar 32 % gospodarjev na družinskih kmetijah.

2

Preglednica / Table

Leto Year	Stopnje samooskrbe (%) Levels of self-sufficiency (%)				
	1996	1997	1998	1999	2000
Žito skupaj Cereals	49,7	55,1	57,5	48,3	50,4
Pšenica Wheat	52,1	43,6	54,4	41,4	51,8
Koruza Grain maize	54,7	67,0	69,4	57,8	53,8
Drugo žito Other cereals	28,7	34,7	29,1	27,1	33,7
Meso in drobovina skupaj Meat and entrails	96,0	95,7	94,6	95,6	92,5
Goveje meso Beef	94,1	101,6	97,7	97,3	97,2
Prašičje meso Pork	83,0	77,0	77,1	81,9	76,2
Perutninsko meso Poultry meat	119,2	112,2	110,1	111,9	109,6
Meso drobnice Sheep and goat meat	92,6	98,0	98,3	100,0	99,9
Mleko - skupna bilanca v ekv. surovega mleka Milk – common balance in fresh milk equivalents	114,9	113,4	120,4	122,7	120,2
Mleko - tržna bilanca svežega mleka in mlečnih izdelkov Milk – market balance for fresh milk and milk products	127,5	121,8	123,6	124,1	125,0
Sir in skuta Cheese and curd	97,3	103,0	108,8	105,0	107,9
Maslo Butter	130,7	118,9	185,3	196,0	159,9
Jajca Eggs	106,7	106,2	99,8	98,8	96,2

Zaradi statusa neto uvoznika pri večini živalskih proizvodov (izjeme so mleko, meso konj in perutninsko meso ter v posameznih letih goveje meso) so doma prirejeni proizvodi namenjeni predvsem domačemu trgu. Nekaj jih najde porabnike tudi na izvoznih trgih, vendar je prehranska bilanca Slovenije izrazito negativna. Še bolj kot za živalske proizvode to velja za žita, tako krmna kot krušna (preglednica 2).



OSKRBA S HRANO IN RAZVOJ PODEŽELJA

Slovenija nima težav z zagotavljanjem zadostnih količin hrane za oskrbo svojega prebivalstva. Vendar pa je pri tem močno odvisna od uvoza, kar še posebej izrazito velja za rastlinska živila oziroma surovine zanje. Prehranska varnost je ob stabilnih razmerah v mednarodnih odnosih in trgovini torej zagotovljena, nikakor pa Slovenija ni samozadostna na tem področju (zlasti pri žitih). Agregatna stopnja samooskrbe se giblje le okoli 80 %, oskrba s hrano pa je zagotovljena globalno.

Tveganje, da bi prišlo do pomanjkanja hrane, v današnjih razmerah ni veliko. Zaradi nizke stopnje samooskrbe bi racionalno lahko govorili o takem tveganju le ob hujših mednarodnih sporih ali izbruhu vojne. Globalno in dolgoročno pa je ta nevarnost najbrž nekoliko večja zaradi enostranskega izkoriščanja naravnih virov in naraščanja prebivalstva. Hrana je razmeroma draga in posamezni kakovostnejši izdelki niso dostopni vsem slojem prebivalstva.

Zaradi razmeroma hitre rasti življenjskega standarda prebivalstva bi lahko sklepali, da se delež prebivalstva, ki živi pod mejo življenjskega minimuma, zmanjšuje. Ker pa ob tem prihaja do zelo velikih razlik v standardu med "elito" in gmotno najšibkejšim slojem prebivalstva, tako vzročno sklepanje ni nujno ustrezno. V skladu z metodologijo Statističnega urada Evropskih skupnosti je prag revščine v obdobju 1997 do 1999 (preračunano na leto 1998) znašal 54 708 SIT mesečno na odraslo osebo. Pod tako določenim pragom revščine je v Sloveniji v tem obdobju živel 13,8 % prebivalstva. Največkrat je to povezano s propadom posameznih podjetij, ki so bila gospodarsko jedro posameznega območja.

Izrazitih gibanj v porabi ni, ker se število prebivalstva ne spreminja. Spreminjajo pa se prehranske navade

Slovenia is a net importer of many animal products (important exceptions are milk, horse meat, and poultry, and in certain years also bovine meat). Products of Slovenian livestock production are therefore intended mainly for domestic consumption. Some of them can also find consumers in foreign markets, but the food balance of Slovenia is strongly negative - this holds true for cereals, both those used in human nutrition and in animal feed, even more than for animal products (Table 2).



FOOD SECURITY AND RURAL DEVELOPMENT

Slovenia has no problems in securing a sufficient quantity of food in order to supply its inhabitants, but it remains strongly dependent on imports, which holds especially for food products of plant origin (especially cereals) and the pertaining raw matter. Food security is guaranteed under conditions of political and economic stability. The aggregate level of self-sufficiency is about 80 % and food supply is secured only globally.

The risk of food shortage is not very high in current circumstances. Even though the level of self-sufficiency in Slovenia is low, one could reasonably talk of such risks only in the event of major international conflicts and wars. Globally, and in the long term, this threat remains somewhat higher due to a one-sided exploitation of natural resources and global population growth. However, our food products remain relatively expensive. Individual products of higher quality are not necessarily accessible to all strata of the population.

Due to a comparatively rapid growth of living standards, the share of the population below the living minimum can be expected to shrink. However, because of significant differences in living standard of the "elite" and the poorest stratum, such a deduction may not necessarily be correct. According to the EUROSTAT methodology, the monthly level of the poverty threshold was put at 330 USD for the period of 1997-1999 (at 1998 prices). In this period 13.8 % of the inhabitants were living below the poverty threshold. Regional deviations are frequently linked to the liquidation of big businesses that had played the role of economic nuclei of some regions.

There are no particular trends in consumption, since the population remains stable. However, consumers' preferences for food products do change, as does the

demand for different products which, in turn, influences the demand for agricultural primary products. Yearly per capita consumption of the most important agricultural products is shown in Table 3.

Awareness of the significance of health food is growing, at least among consumers for whom this is financially affordable. Consequently, there is some decrease in the demand for kinds of meat that are supposedly more risky (e. g. beef after the BSE outbreak).

porabnikov in s tem povpraševanje po drugačnih izdelkih, kar posredno vpliva tudi na povpraševanje po osnovnih kmetijskih proizvodih. Letna poraba najpomembnejših kmetijskih proizvodov na prebivalca je prikazana v preglednici 3.

Povečuje se ozaveščenost prebivalstva o pomenu zdrave hrane, vsaj tistega dela, ki si to gmotno lahko tudi privošči. Posledično se nekoliko zmanjšuje povpraševanje predvsem po tistih vrstah mesa, ki naj bi bile bolj tvegane (npr. govedina po odkritju BSE).

3

Preglednica / Table

Leto Year	Poraba na prebivalca (kg/leto) Consumption per capita (kg/yr)				
	1996	1997	1998	1999	2000
Žito skupaj (v moki) <i>Cereals (flour)</i>	96,2	94,7	96,3	98,4	103,5
Pšenica (v moki) <i>Wheat (flour)</i>	79,4	79,8	80,0	81,6	87,0
Koruba (v moki) <i>Grain maize (flour)</i>	15,4	14,0	15,3	15,8	15,3
Drugo žito (v moki) <i>Other cereals (flour)</i>	1,4	0,9	1,1	1,1	1,2
Meso in drobovina skupaj <i>Meat and entrails</i>	95,8	100,7	96,6	95,9	94,3
Goveje meso <i>Beef</i>	27,6	26,8	23,0	22,1	21,8
Prašičje meso <i>Pork</i>	36,0	38,7	39,6	41,5	38,7
Perutninsko meso <i>Poultry meat</i>	26,1	30,4	30,5	27,7	29,1
Meso drobnice <i>Sheep and goat meat</i>	0,3	0,3	0,4	0,5	0,6
Mleko - skupna bilanca v ekv. surovega mleka <i>Milk - common balance in fresh milk equivalents</i>	210,3	210,3	209,4	215,0	225,6
Mleko - tržna bilanca svežega mleka in mlečnih izdelkov <i>Milk - market balance for fresh milk and milk products</i>	118,2	120,9	118,3	124,6	129,4
Sir in skuta <i>Cheese and curd</i>	8,7	8,9	9,6	9,8	10,0
Maslo <i>Butter</i>	0,9	0,9	0,9	1,2	1,1
Jajca <i>Eggs</i>	9,9	11,0	11,5	11,6	11,5



OCENA STANJA GENSKIH VIROV V ŽIVINOREJI



THE STATE OF GENETIC RESOURCES IN THE FARM ANIMAL SECTOR

PREGLED PROIZVODNIH SISTEMOV V ŽIVINOREJI V POVEZAVI Z BIOTSKO RAZNOVRSTNOSTJO

OVERVIEW OF THE COUNTRY'S ANIMAL PRODUCTION SYSTEMS AND RELATED ANIMAL BIOLOGICAL DIVERSITY

Na kmetijskih gospodarstvih pogosto – skoraj praviloma – srečamo več vrst domačih živali, kar natančneje prikazuje preglednica 4.

4

Preglednica / Table

Število živalskih vrst na kmetijah v letu 2000
Number of farm animal species on the farms in 2000

Število živalskih vrst No. of species	0	1	2	3	4	5	6	7	8	9
Število kmetij No. of farms	11 684	23 447	35 804	11 840	2 893	620	136	39	3	1
Delež vseh Percentage of total	13,5	27,1	41,4	13,7	3,3	0,7	0,2	0,0	0,0	0,0

Skoraj na 70 % kmetijskih gospodarstev z živalmi srečamo več kot eno vrsto domačih živali. Na polovici gospodarstev z živalmi sta zastopani 2 vrsti domačih živali, pogosto pa srečamo tudi 3, 4 ali 5 vrst domačih živali.

Med vrstami domačih živali, vključenimi v poročilo, imajo največjo gospodarsko težo govedo, prašiči in perutnina, pri neproizvodnih funkcijah kmetijstva pa govedo, drobnica in konji.

Prevladujejo proizvodni sistemi z majhnim in srednjim vložkom, zlasti pri razvrstitvi na podlagi števila rej. Če upoštevamo stalež živali na posameznih kmetijskih gospodarstvih, pa pri nekaterih vrstah opazimo obrnjen položaj, ko ima razmeroma majhno število sorazmerno velikih rej (na velikih farmah) z velikim vložkom izredno velik delež v celotnem staležu, kar se odraži v prevladi proizvodnih sistemov z velikim vložkom v nacionalni populaciji teh vrst domačih živali (pri prašičih, kokoših in purah). To natančneje ponazarja tudi preglednica 5.

Možen nasprotuoč si rezultat pri razporeditvi v različne proizvodne sisteme na podlagi števila rej ali števila živali je še poudarjen na sliki 2, ki prikazuje položaj pri govedu in prašičih.

Several different species of farm animals can almost as a rule be found on farms, which is presented in Table 4.

As much as 70 % of farms with animals keep more than one species of farm animals. Half of the farms keep two species. Farms with three, four or more species of farm animals can also frequently be found.

Among the species presented in the report, cattle, pigs and poultry are economically the most important, while cattle, small ruminants and horses hold the most important role in non-productive functions of agriculture.

Low and medium input systems are prevalent, especially in terms of the number of farms. However, if the number of farm animals on individual farms are considered, an inverse situation in some species can be observed. Namely, a comparatively small number of large-scale commercial farms with high input take up an extremely high share of the total animal population (especially in pigs, chickens and turkeys). This is reflected in the prevalence of high input production systems in the national population of these species. This is illustrated more precisely in Table 5.

A potentially contradictory result of classifying into production systems on the basis of the number of farms or number of animals is even more emphasised in Figure 2, which shows the situation in cattle and pig production.

Razporeditev v proizvodne sisteme na podlagi števila rej in števila živali pri posameznih vrstah v letu 2000
Production systems according to the number of farms and the number of animals per individual species in 2000

Vrsta Species	Delež živinorejskih kmetij Share of farms with livestock				Delež staleža živali v proizvodnih sistemih Share of livestock inventory by production systems			
	Število kmetij Number farms	Majhen vložek Low input	Srednji vložek Medium input	Velik vložek High input	Stalež živali Livestock inventory (000)	Majhen vložek Low input	Srednji vložek Medium input	Velik vložek High input
Govedo Cattle	56 097	42,2	39,7	18,1	500	27,7	48,5	23,8
Ovce Sheep	4 330	73,5	23,8	2,6	96	59,2	36,4	4,3
Koze Goats	4 775	78,1	20,3	1,6	29	60,9	32,5	6,6
Konji Horses	4 634	18,4	54,7	27,0	14	15,1	58,2	26,7
Prašiči Pigs	44 623	69,7	23,4	7,0	602	19,2	11,9	68,7
Kokoši Chickens	56 687	52,7	39,2	8,1	5 835	5,5	5,8	88,7
Pure Turkeys	1 361	42,2	47,3	10,5	200	1,4	2,2	96,4
Race Ducks	2 771	41,9	48,9	9,2	20	27,6	49,9	22,5
Gosi Geese	908	46,2	46,9	6,8	4	34,8	48,7	16,5
Kunci* Rabbits	12 682	68,1	22,4	9,4	180	49,5	31,9	18,5
Čebele** Honey bees	8 332	85,6	13,6	0,8	156 880	74,0	23,5	2,5

* Razvrstitev glede na število kunk./Classification according to the number of rabbit does.

** Gre za čebelje družine, ne število živali v 000./Number of hives of bees.

Cattle are present on 2/3 of farms, of which approximately equal shares can be attributed to low and medium input (40 % each). Subsistence and smallholder farms prevail (slightly more than a third of all units each), while small-scale commercial farms account for 25 % of all units. Large scale commercial farms (with more than 30 animals) account for a mere 4 % of all units. Taking into account the size of herd, medium input production systems prevail (nearly a half of the population), with low and high input production systems having almost equal shares (each a fourth of the population).

Both **sheep and goats** can be found on some 5 % of farms, and are almost predominantly characterized by low input production systems, which are present in 3/4 of all farms and some 3/5 of the total animal population. Medium input systems account for slightly more than 1/5 of farms and include a third of all animals. High input has a low share, both as regards the number of farms and the number of animals in the flocks.

In **horses**, with the same farm incidence as sheep and goats, the difference in classification by number of farms and the number of animals is minimal. Medium input production systems prevail with some 55 %. Low input production systems account for 1/6, and high input production systems for 1/4.

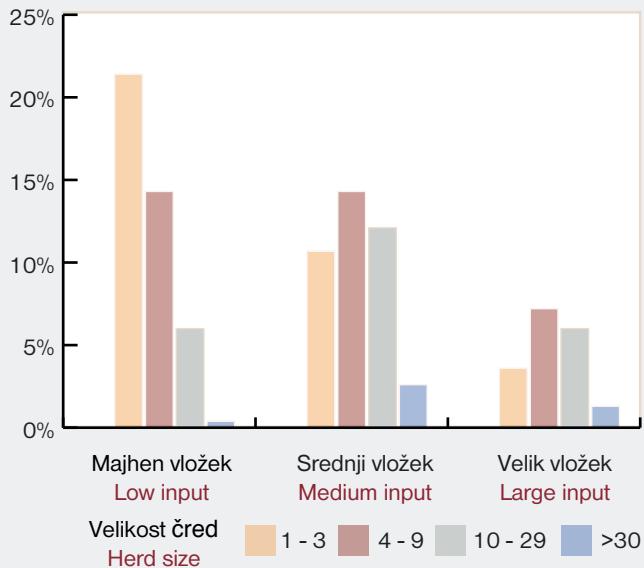
Pri **govedu**, ki ga srečamo na 2/3 kmetijskih gospodarstev, ugotavljamo približno enak delež rej z majhnim in srednjim vložkom (vsakih okoli 40 %). Prevladujejo samooskrbne in majhne kmetije (vsakih dobra tretjina), četrtina je srednje velikih kmetij in le okoli 4 % je velikih kmetij in kmetijskih podjetij s staležem nad 30 goved. Ob upoštevanju velikosti čred prevladujejo proizvodni sistemi s srednjim vložkom (slaba polovica celotne populacije), medtem ko imajo sistemi z majhnim in velikim vložkom skoraj enak delež (vsak približno četrtina).

Pri **ovcah in kozah** – vsako od teh vrst najdemo na okoli dvajsetini vseh gospodarstev – je daleč najpomembnejša prireja z majhnimi vložki, ki pri obeh vrstah pomeni približno 3/4 vseh rej in okoli 3/5 celotne populacije. Rej s srednjim vložkom je dobra petina, ta proizvodni sistem pa zajema okoli 1/3 celotnega staleža. Velik vložek ima nizek delež z vidika števila rej in zastopanosti živali v teh tropih.

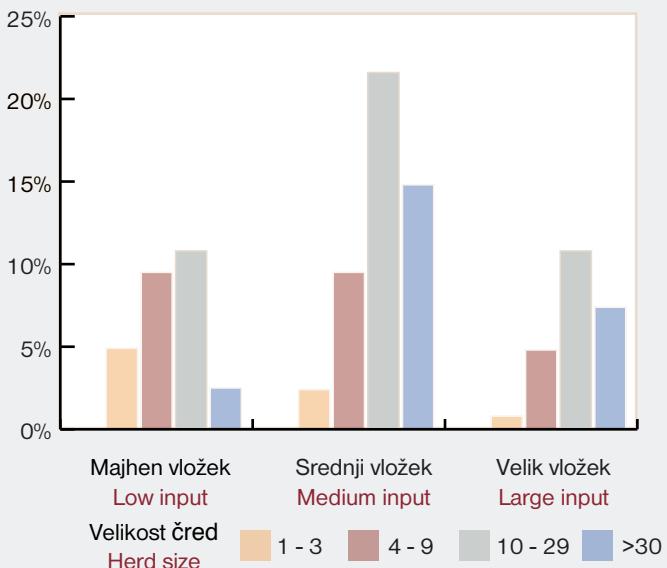
Pri **konjih** s podobno pogostnostjo na kmečkih dvoriščih kot drobnica opažamo najmanjšo razliko med razvrstitvijo po številu rej in staležu živali. Prevladujejo proizvodni sistemi s srednjim vložkom z okoli 55 %, sistemov z majhnim vložkom je približno šestina, dobra četrtina pa je proizvodnih sistemov z velikim vložkom.

Razporeditev v proizvodne sisteme na podlagi števila rej oz. števila živali pri govedu in prašičih v letu 2000 Production systems in cattle and pigs, based on the number of farms and number of animals in 2000

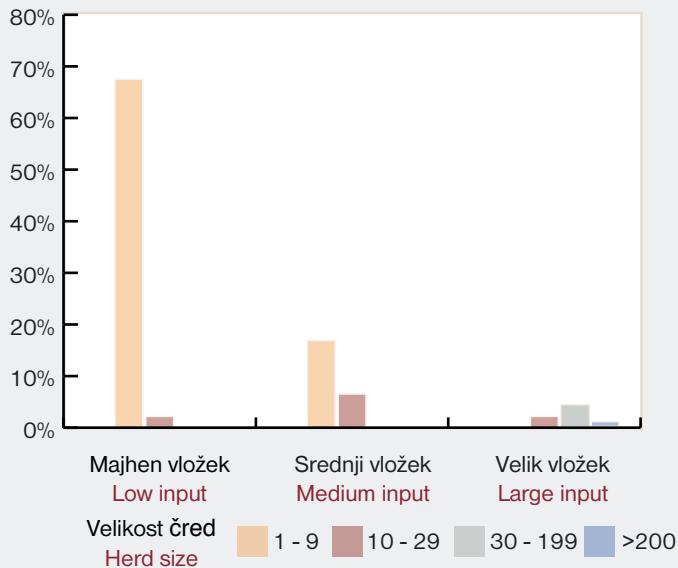
Govedo - razvrstitev rej
Cattle - classification of farms



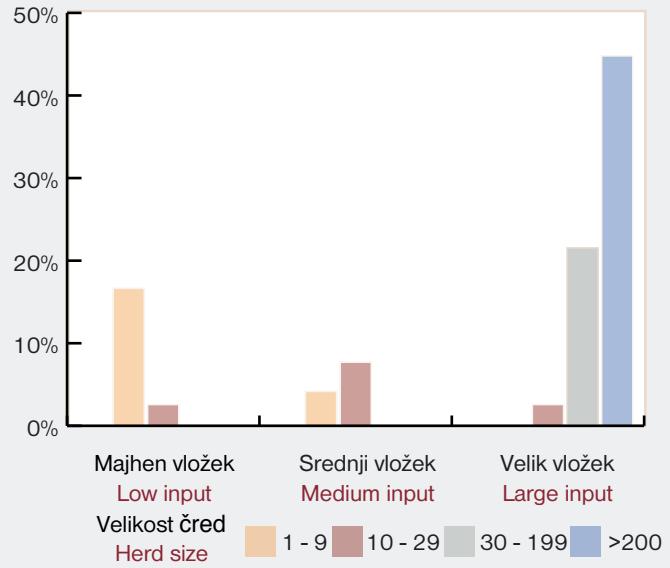
Govedo - razvrstitev populacije živali
Cattle - classification of animal inventory



Prašiči - razvrstitev rej
Pigs - classification of farms



Prašiči - razvrstitev populacije živali
Pigs - classification of animal inventory



Prašiče srečamo na okoli polovici kmetijskih gospodarstev. Kar 70 % rej lahko opredelimo kot reje z majhnim vložkom, vendar gre praviloma za reje v majhnem obsegu, ki skupaj prispevajo le 20 % celotnega staleža. Slaba četrtina rej po dogovorjenih merilih (glej razlago v prilogi C) sodi v sisteme s srednjim vložkom, stalež živali na teh gospodarstvih pa je za polovico nižji (osmina). 7 % večinoma večjih in razmeroma intenzivnih farmskih rej z velikim vložkom pa prispeva skoraj 70 % celotnega staleža.

Pigs are present on 50 % of farms, and 70 % of pig farms can be classified as low input production systems. These are mainly small farms that contribute only 20 % of the total pig inventory. Less than a fourth of farms can be classified according to criteria agreed by local experts (see Appendix C) as medium input systems. The number of animals on these farms is lower by a half (only one eighth). Seven percent of large and comparatively quite intensive high input farms contribute almost 70 % of the total number of animals.

A similar, but even more pronounced difference between the number of farms and the share of the total number of animals on these farms can be observed in **chickens and turkeys**, again because there are large concentrations of animals on a small number of farms. Chickens can be found on two thirds of farms, with low input production systems as the most frequent. Since these are mostly small farms (fewer than 20 birds) they contribute only some five percent of the total number of animals. Five percent of farms that have been classified as high input production systems contribute more than 7/8 of the total population. Two fifths of farms with medium input production systems thus maintain the same share of population as the much higher share of low input farms. Turkey is infrequent in Slovenia and can be found on less than two percent of all farms. Less than ten percent of high input farms dominate almost the entire turkey population (over 96%).

Geese are even less common (on less than 1 % of farms), as are ducks (some 3 % of farms). In both species these are mainly subsistence and smallholder farms, with a similar share of low and medium input production systems. High input production can be found only exceptionally. The number of animals is the highest in medium input production systems.

Rabbits can be found on almost 10 % of agricultural households, where subsistence low and medium input production prevails. In total, low input systems account for 7/10 of all farms, with 50 % of all animals. Medium input systems account for one fifth of farms and less than a third of animals. The share of high input farms is also in rabbits significantly lower than is the share of rabbits in the total number of animals on these farms.

Honey bees can be found quite frequently also in non-agricultural households. The distribution of production systems is similar to that in small ruminants. Low input production systems prevail. This applies to the number of beekeepers as well as the numbers of hives of bees.

1.1.1

Relative importance of locally adapted breeds

The importance of locally adapted breeds differs significantly with regard to particular species. Sheep production is characterized mostly by autochthonous breeds. Exotic and continually imported breeds are significant as male lines in cross-breeding. The latter is the case with the majority of the most prevalent species of farm animals. In order to protect the autochthonous Carniolan honey bee, rearing and trade with other bee breeds is not allowed in Slovenia.

Podobna, a še izrazitejša razlika med številom rej in zastopanostjo celotnega staleža v njih je pri **kokoših in purah**, spet zaradi velike koncentracije živali na manjšem številu farmskih rej. Kokoši srečamo na dveh tretjinah kmetijskih gospodarstev, na katerih prevladujejo sistemi z majhnim vložkom. Ker pa gre večinoma za majhne reje (pod 20 kljunov), te prispevajo le dobro dvajsetino celotnega staleža živali. Dvanajstina rej, ki smo jih uvrstili med reje z velikim vložkom, pa prispeva več kot 7/8 celotnega staleža. Na 2/5 rej s srednjim vložkom tako odpade približno enak delež staleža kot na precej večji delež rej z majhnim vložkom. Pura v Sloveniji ni razširjena živalska vrsta, najdemo jo na manj kot 2 % kmetijskih gospodarstev. Slabih 10 % rej z velikim vložkom obvladuje skoraj celotno populacijo živali (nad 96 %).

Še manj pogosto na kmetijskih gospodarstvih srečamo **gosi** (pod 1 % gospodarstev), precej poredko pa tudi race (okoli 3 % gospodarstev). V obeh primerih gre pretežno za samooskrbne in majhne kmetije s približno enakim deležem rej z majhnim in srednjim vložkom, rej z velikim vložkom skorajda ne najdemo. Po staležu prevladujejo sistemi s srednjim vložkom.

Pri **kuncih**, ki jih srečamo skoraj na desetini kmetijskih gospodarstev, prevladujejo samooskrbne kmetije z majhnim in srednjim vložkom, skupaj pa na sisteme z majhnim vložkom odpade skoraj 7/10 vseh rej z okoli polovico celotnega staleža. Sistemi s srednjim vložkom po številu rej zavzemajo dobro petino, po staležu pa slabo tretjino. Tudi pri kuncih je delež rej z velikim vložkom bistveno nižji kot njihov delež v celotnem staležu.

Pri **čebelah**, ki jih pogosto srečamo tudi na nekmetijskih gospodarstvih, je razvrstitev v proizvodne sisteme še najbližja tisti pri drobnici. Po številu čebelarjev in pogostnosti čebeljih družin prevladujejo proizvodni sistemi z majhnim vložkom.

Relativen pomen lokalno prilagojenih pasem

Pomen lokalno prilagojenih pasem v prireji je med vrstami zelo različen. Pri ovčereji poteka večina prireje z domačimi avtohtonimi pasmami. Tujerodne in stalno uvožene pasme pa so pomembnejše predvsem kot moške linije pri križanjih. To velja za večino najbolj razširjenih vrst domačih živali. Zaradi varovanja obstoja avtohtone kranjske čebele na območju Republike Slovenije nista dovoljena reja drugih pasem čebel in promet z njihovim plemenskim materialom.

Značilnosti organizacije posameznih proizvodnih sistemov

Večina kmetijskih gospodarstev je v zasebni lasti, prevladujejo družinske kmetije. Izjema so le velike kmetije in kmetijska gospodarstva pri prašičih, kokoših in purah, nekaj tudi pri govedu, ki so se razvila iz nekdanih družbenih podjetij in so zdaj zasebne družbe, njihova lastnina pa je delno še državna.

6

Preglednica / Table

Povprečna velikost kmetij, prikazana s številom glav živali
Average size of farms expressed by the number of animals

Vrsta Species	Govedo Cattle	Ovce Sheep	Koze Goats	Konji Horses	Prašiči Pigs	Kokoši Chicken	Pure Turkey	Gosi Ducks	Race Geese	Kunci* Rabbits	Čebele** Honey bees
Samooskrbne kmetije Subsistence	2	3	3	1,4	3	9	4	4	3	10	5
Majhne kmetije Smallholder	6	10	9	3,4	16	30	14	14	14	23	22
Srednje velike kmetije Small-scale-commercial	16	25	23	6,3	67	181	43	40	52	39	72
Velike kmetije in kmetijska podjetja Large-scale-commercial	51	88	74	17,8	1 390	11 409	5 613	138	/	1 892	164
Skupaj Total	9	22	6	3,1	14	103	147	7	5	22	15

* Število plemenskih kunk./Number of rabbit does.

** Število čebeljih družin./Bee families.

Povprečna velikost kmetij, izračunana s številom glav živali, je razvidna iz preglednice 6 (na podlagi statističnih podatkov in dogovorjenih merit - priloga C4).

Proizvodni sistemi z majhnimi vložki temeljijo na lastnih vložkih, pri sistemih s srednjimi vložki srečamo kombinacijo lastnih in nekaterih kupljenih vložkov, vendar praviloma z vidika proizvodnih stroškov prevladujejo lastni vložki. Tako prirejo še vedno lahko uvrščamo med dokaj trajnostno, medtem ko so sistemi z velikim vložkom močno, nekateri pa skoraj povsem odvisni od kupljenih vložkov.

Med pomembnejše živalske proizvode lahko uvrščamo meso živali (vseh navedenih vrst), mleko (kravje, kozje in ovčje) in jajca (perutnina, predvsem kokoši). Volna nima večje gospodarske vrednosti, podobno velja tudi za živalske kože. Gnoj je pomemben predvsem z vidika ohranjanja rodovitnosti tal, s kratkoročnega ekonomskega vidika pa je zlasti pri večjih rejah pogosto celo nezaželen stranski proizvod. Narašča pomen živali in živinoreje za ohranjanje kulturne krajine, torej pri gospodarjenju s prostorom, povečuje pa se tudi vloga živali pri kulturno-rekreacijski dejavnosti.

Organizational characteristic of each production system

1.1.2

Most agricultural units are privately owned. Family farms predominate. Exceptionally, there exist large-scale commercial farms with pigs, chickens and turkeys, and to a lesser degree with cattle. These farms have descended from former state agricultural enterprises and now continue as private companies, with the state controlling a share of ownership.

The average size of farms expressed by the number of animals can be seen in Table 6 (based on statistical data and agreed criteria - see Appendix C4).

Low input production systems are based on their own inputs. Medium input production systems involve a combination of both own and purchased inputs. However, in terms of the structure of production costs, own inputs are still predominant, so this type of production can be considered as fairly self-sustaining. High input production systems are heavily, some of them almost entirely, dependent on purchased inputs.

The more important products of animal origin are the following: meat (of all species under consideration), milk (mainly cow, but also sheep and goat) and eggs (poultry esp. chickens). Wool has little economic importance, nor do have animal skins. Manure is important with regard to maintaining soil fertility. However, in the short term, it can often even be considered to be an undesired by product, especially in large scale production. The significance of animals and livestock production is growing with regard to conservation of rural landscape. The role of farm animals in cultural and recreational activities is also growing.

We do not attain self sufficiency in most agricultural markets, so we are net importers. For this reason it is obvious that animal products are aimed chiefly at the domestic market. There are considerable exceptions in milk (20 % is exported, with an increasing trend in the last 10 years) and poultry production. In the near future, with Slovenian accession to the EU, we can expect significant changes in the profitability of production in individual animal categories and species. This will bring about changes in trade flows with food of animal origin. Slovenia will, nevertheless, remain a net importer of most products.

Slovenia is characterized by an unfavourable size structure of farms if this is judged from the aspect of a size that enables setting conditions for more profitable, larger scale production. Changes have been occurring, albeit somewhat slowly. We can talk about a trend of decreasing economic importance (also in securing food supply) of low input production units. These are still being kept in existence but are also “dying off” or are advancing towards the form of medium input systems. The grounds for these changes are mostly economic. Reverse processes are present on a smaller scale. These may in future involve a transformation of high input systems into more environment-friendly units. This change of production systems is usually linked to an increase in production or, on the other hand, to a reduction in intensity or even abandonment of production on many farms. We are facing a critical period of rapid changes both in size structure and in methods of organizing production. It is not easy to predict either long-term or medium-term changes. These will, however, certainly not be insignificant.

Ten years ago, dispersion of production, in the sense of self-sustainability, was even greater, as was the number of species on individual farms. Farms were also even smaller. The explanation for the changes can mostly be found in economic motives. We expect the trends of changes in the structure of production systems to continue. However, since natural conditions in Slovenia are unfavourable for intensive production, and society at large has also recognized the significance of agriculture in satisfying aims other than mere production we also count on conservation of a significant part of low and medium input production systems.

Na večini kmetijskih trgov ne dosegamo samozadostnosti in smo neto uvozniki, torej praviloma lahko govorimo o tem, da so živalski proizvodi namenjeni predvsem domačemu trgu. Pomembnejši izjemi sta mleko (skoraj petina prieje za izvoz, v zadnjih 10 letih se je delež izvoza povečal) in prieja perutninskega mesa. V prihodnje – v vključitvijo v EU – lahko pričakujemo precejšnje spremembe pri gospodarnosti prieje posameznih vrst in kategorij živali, kar se bo kazalo tudi v spremenjenih zunanjetrgovinskih tokovih z živilimi živalskega izvora. Vendar bo Slovenija še naprej ostala neto uvoznica pri večini izdelkov.

Za Slovenijo je značilna neugodna velikostna sestava kmetijskih gospodarstev, vsaj če to presojamo z vidika doseganja velikosti, ki omogoča zagotavljanje razmer za konkurenčno proizvodnjo večjega obsega. Spremembe potekajo, čeprav razmeroma počasi, vendar pa lahko govorimo o zmanjševanju gospodarske pomembnosti – tudi oskrbe s hrano – rej z majhnim vložkom, ki se sicer še v velikem številu ohranjajo, vendar razmeroma pogosto tudi “odmirajo” ali pa prehajajo v proizvodne sisteme s srednjim vložkom. Vzroki za te spremembe so pretežno ekonomski. Obraten proces, ki ga v prihodnje najbrž lahko pričakujemo na ravni spreminjanja sistemov z velikim vložkom v okolju prijaznejše, poteka v manjši meri. To prehajanje med proizvodnimi sistemi je običajno povezano s povečevanjem velikosti reje ali pa na drugi strani z ekstenziviranjem ali celo opuščanjem reje na posameznih kmetijskih gospodarstvih. Zdi se, da smo z vidika velikostne sestave in prakse izvajanja proizvodnih sistemov v kritičnem obdobju hitrih sprememb, pri čemer je težko napovedati dolgoročne in srednjoročne spremembe. Vsekakor pa te ne bodo majhne.

Pred 10 leti je bila razpršenost rej v smislu samoskrbne naravnosti še večja, število vrst domačih živali na gospodarstvih večje, povprečna velikost rej na gospodarstvih pa še manjša. Tudi tu lahko iščemo vzroke za spremembe predvsem v ekonomski logiki. Pričakujemo lahko, da se bo sestava proizvodnih sistemov še naprej spreminja. Vendar pa zaradi neugodnih naravnih razmer za intenzivno živinorejo in čedalje večjega pomena kmetijstva pri zagotavljanju neproizvodnih funkcij, kar mu priznava družba v celoti, lahko pričakujemo ohranitev pomembnega deleža slovenske živinoreje v proizvodnih sistemih z majhnim in srednjim vložkom.

OCENA STANJA OHRANJANJA BIOTSKE RAZNOVRSTNOSTI V ŽIVINOREJI

Stanje genske raznovrstnosti

Biotska raznovrstnost domačih živali je v Sloveniji postala pomembna v osemdesetih letih, ko je bila v Evropi ustanovljena banka genetskih podatkov domačih živali. Slovenija se je v delo vključila na samem začetku in dala prve podatke o nekaterih avtohtonih slovenskih pasmah domačih živalih, pozneje pa še podatke o drugih pasmah, ki so prisotne v slovenskem prostoru ter imajo v naši državi pomen s prehranskega in kmetijskega stališča. V nadaljevanju so v preglednicah predstavljene pasme pri posameznih vrstah domačih živali.

Pasme so razdeljene v skupine po postopku, ki ga je izdelal FAO za potrebe tega projekta. Dodane so še ocene gibanj v velikosti populacije posamezne pasme: stabilno, zmanjševanje ali povečevanje.

ASSESSING THE STATE OF CONSERVATION OF FARM ANIMAL BIOLOGICAL DIVERSITY

1.2

1.2.1

The state of genetic diversity

In Slovenia, biodiversity became prominent in the 80s with the establishment of the European farm animals gene databank. Slovenia began to participate at the very beginning and contributed the first data on Slovenian autochthonous breeds of farm animals. Later, other breeds that are also kept in Slovenia, which are important for nutritional and agricultural reasons, were included. The tables below show farm animal species with the respective breeds.

The breeds have been divided into groups according to the procedures worked out by FAO for the requirements of this project. Estimation of trends in population size of each respective breed is also added: stable, decreasing or increasing.

7

Preglednica / Table

Pasme goved v Sloveniji, njihova razvrstitev v lokalno prilagojene in tujerodne pasme z oceno gibanj v velikosti populacije Cattle breeds in Slovenia, their classification into locally adapted breeds and exotic breeds with an estimation of trends in population size

Kategorija Category	Število pasem No. of breeds	Pasma Breed
LOKALNO PRILAGOJENE LOCALLY ADAPTED BREEDS	3	
Ogrožene At risk	1	cikasto govedo ⁱⁿ <i>Cika cattleⁱⁿ</i>
Razširjene Widely used	2	slovensko rjavo govedo ^{de} , lisasto govedo st <i>Slovenian Brown cattle^{de}, Simmental cattlest</i>
Druge Others	-	
TUJERODNE EXOTIC BREEDS	8	
Razširjene Widely used	3	črno-belo govedo (holštajnsko) ⁱⁿ , šarole ^{st*} , limuzin ^{in*} <i>Black and White cattle (Holstein)ⁱⁿ, Charolais^{st*}, Limousin^{in*}</i>
Druge Others	5	galloway st , visoko gorsko škotsko govedo ⁱⁿ , rdeči angus st , rdeči holštajn ⁱⁿ , montbeliard ⁱⁿ <i>Gallowayst, Scottish Highland cattleⁱⁿ, Red Angusst, Red Holsteinⁱⁿ, Montbeliardⁱⁿ</i>

* = stabilno, ^{de} = zmanjševanje, ⁱⁿ = povečevanje

* Stalež živilih živali je majhen, število doz semena pa je veliko.

st = stable, ^{de} = decreasing, ⁱⁿ = increasing

* The inventory of live animals is low; however, there exist many doses of semen.

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Preglednica / Table

Pasme ovc v Sloveniji, njihova razvrstitev v lokalno prilagojene in tujerodne pasme z oceno gibanj v velikosti populacije
Sheep breeds in Slovenia, their classification into locally adapted breeds and exotic breeds with an estimation of trends in population size

Kategorija Category	Število pasem No. of breeds	Pasma Breed
LOKALNO PRILAGOJENE LOCALLY ADAPTED BREEDS	5	
Ogrožene At risk	2	istrska pramenka ⁱⁿ , belokranjska pramenka ⁱⁿ <i>Istrian Pramenkaⁱⁿ, Bela Krajina Pramenkaⁱⁿ</i>
Razširjene Widely used	3	bovška ovca ⁱⁿ , jezersko-solčavska ovca ⁱⁿ , oplemenjena jezersko-solčavska ovca ⁱⁿ <i>Bovec sheepⁱⁿ, Jezersko-Solcava sheepⁱⁿ, Improved Jezersko-Solcava sheepⁱⁿ</i>
Druge Others	-	
TUJERODNE EXOTIC BREEDS	1	
Razširjene Widely used	-	
Druge Others	1	texel ⁱⁿ <i>Texelⁱⁿ</i>

st = stabilno, ^{de} = zmanjševanje, ⁱⁿ = povečevanje
st = stable, ^{de} = decreasing, ⁱⁿ = increasing

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Preglednica / Table

Pasme koz v Sloveniji, njihova razvrstitev v lokalno prilagojene in tujerodne pasme z oceno gibanj v velikosti populacije
Goat breeds in Slovenia, their classification into locally adapted breeds and exotic breeds with an estimation of trends in population size

Kategorija Category	Število pasem No. of breeds	Pasma Breed
LOKALNO PRILAGOJENE LOCALLY ADAPTED BREEDS	3	
Ogrožene At risk	1	drežniška koza ⁱⁿ <i>Drenica goatⁱⁿ</i>
Razširjene Widely used	2	slovenska sanska koza ⁱⁿ , slovenska srnasta koza ⁱⁿ <i>Slovenian Saanen goatⁱⁿ, Slovenian Alpine goatⁱⁿ</i>
Druge Others	-	
TUJERODNE EXOTIC BREEDS	1	
Razširjene Widely used	-	
Druge Others	1	burska koza ⁱⁿ <i>Boer goatⁱⁿ</i>

st = stabilno, ^{de} = zmanjševanje, ⁱⁿ = povečevanje
st = stable, ^{de} = decreasing, ⁱⁿ = increasing

Preglednica / Table

10

Pasme konj v Sloveniji, njihova razvrstitev v lokalno prilagojene in tujerodne pasme z oceno gibanj v velikosti populacije
Horse breeds in Slovenia, their classification into locally adapted breeds and exotic breeds with an estimation of trends in population size

Kategorija Category	Število pasem No. of breeds	Pasma Breed
LOKALNO PRILAGOJENE LOCALLY ADAPTED BREEDS	4	
Ogrožene At risk	2	lipicanski konj ⁱⁿ , posavski konj ^{de} Lipizzan horseⁱⁿ, Posavje horse^{de}
Razširjene Widely used	1	slovenski hladnokrvni konj ^{de} Slovenian Cold-Blooded horse^{de}
Druge Others	1	ljutomerski kasač ⁱⁿ Ljutomer trotterⁱⁿ
TUJERODNE EXOTIC BREEDS	7	
Razširjene Widely used	3	haflinski konj st , slovenski toplokrvni konj ⁱⁿ , noriški konj st Haflingerst, Slovenian Warm-Blooded horseⁱⁿ, Noric horsest
Druge Others	4	hanoveranec ^{de} , arabec ⁱⁿ , islandski konj ⁱⁿ , polnokrvni anglež ⁱⁿ Hannoverian^{de}, Arabⁱⁿ, Icelandic horseⁱⁿ, Thoroughbredⁱⁿ

st = stabilno, ^{de} = zmanjševanje, ⁱⁿ = povečevanjest = stable, ^{de} = decreasing, ⁱⁿ = increasing

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Pasme prašičev v Sloveniji, njihova razvrstitev v lokalno prilagojene in tujerodne pasme z oceno gibanj v velikosti populacije
Pig breeds in Slovenia, their classification into locally adapted breeds and exotic breeds with an estimation of trends in population size

Kategorija Category	Število pasem No. of breeds	Pasma Breed
LOKALNO PRILAGOJENE LOCALLY ADAPTED BREEDS	4	
Ogrožene At risk	1	krškopoljski prašič st Krsko Polje pigst
Razširjene Widely used	3	švedska landras st , nemška landras st , large white st Swedish Landracest, German Landracest, Large Whitest
Druge Others	-	
TUJERODNE EXOTIC BREEDS	3	
Razširjene Widely used	2	pietrain st , duroc st Pietrainst, Durocst
Druge Others	1	large white 66 st Large White 66st

st = stabilno, ^{de} = zmanjševanje, ⁱⁿ = povečevanjest = stable, ^{de} = decreasing, ⁱⁿ = increasing

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Preglednica / Table

Pasme kokoši v Sloveniji, njihova razvrstitev v lokalno prilagojene in tujerodne pasme z oceno gibanj v velikosti populacije
Chicken breeds in Slovenia, their classification into locally adapted breeds and exotic breeds with an estimation of trends in population size

Kategorija Category	Število pasem No. of breeds	Pasma Breed
LOKALNO PRILAGOJENE LOCALLY ADAPTED BREEDS	7	
Ogrožene <i>At risk</i>	6	štajerska kokoš st (variacija: jerebičasta) slovenska grahasta kokoš st , slovenska srebrna kokoš st , bela plimutka (linija B) st , bela plimutka (linija P) st , slovenska sintetična linija (WM) st Partridge Styrian hen st , Slovenian Barred hen st , Slovenian Silver hen st , White Plymouth Rock (line: B) st , White Plymouth Rock (line: P) st , Slovenian Synthetic line WM st
Razširjene <i>Widely used</i>	-	
Druge <i>Others</i>	1	rodajland st Rhode Island Red st
TUJERODNE EXOTIC BREEDS	60*	
Razširjene <i>Widely used</i>	**	** **
Druge <i>Others</i>	60*	

st = stabilno, ^{de} = zmanjševanje, ⁱⁿ = povečevanje / st = stable, ^{de} = decreasing, ⁱⁿ = increasing

* V okviru društev gojiteljev pasemskeih malih živali so po zbranih podatkih v letu 2002 gojili približno 60 različnih pasem kokoši (velikih in pritlikavih), enajst pasem rac, sedem pasem gosi in tri pasme pur (priloge D1, D2, D3, D4 in D5).

** V preglednici niso naštete pasme oz. linije, ki so vključene v pridobivanje križancev (večnacionalnih selekcijskih družb), ki se uporabljajo v industrijski pritejnosti (ocena: 90 % proizvodnje).

* According to the Small Animals Breeders' Association data for the year 2002, about sixty different chicken breeds (large and bantams) were bred, eleven duck breeds, seven goose breeds and three turkey breeds (Appendices D1, D2, D3, D4 and D5.)

** The table does not contain breeds or lines which have been involved in obtaining cross-breeds (of multinational selection services) which are used in industrial production (estimates: 90 % of production).

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Preglednica / Table

Pasme kuncev v Sloveniji, njihova razvrstitev v lokalno prilagojene in tujerodne pasme z oceno gibanj v velikosti populacije
Rabbit breeds in Slovenia, their classification into locally adapted breeds and exotic breeds with an estimation of trends in population size

Kategorija Category	Število pasem No. of breeds	Pasma Breed
LOKALNO PRILAGOJENE LOCALLY ADAPTED BREEDS	2	
Ogrožene <i>At risk</i>	2	SIKA (linija A) st , Sika (linija C) st SIKA (line: A) st , Sika (line: C) st
Razširjene <i>Widely used</i>	-	
Druge <i>Others</i>	-	
TUJERODNE EXOTIC BREEDS	43*	
Razširjene <i>Widely used</i>	-	
Druge <i>Others</i>	43*	

st = stabilno, ^{de} = zmanjševanje, ⁱⁿ = povečevanje / st = stable, ^{de} = decreasing, ⁱⁿ = increasing

* V okviru društev gojiteljev malih živali so po zbranih podatkih v letu 2001 gojili 43 različnih pasem kuncev (priloga D6).

* According to the Small Animals Breeders' Association data for the year 2001, 43 different rabbit breeds were bred (Appendix D6).

Pasme čebel v Sloveniji, njihova razvrstitev v lokalno prilagojene in tujerodne pasme z oceno gibanj v velikosti populacije
Honey bee breeds in Slovenia, their classification into locally adapted breeds and exotic breeds with an estimation of trends in population size

Kategorija Category	Število pasem No. of breeds	Pasma Breed
LOKALNO PRILAGOJENE LOCALLY ADAPTED BREEDS	1	
Ogrožene <i>At risk</i>	-	
Razširjene <i>Widely used</i>	1	kranjska čebela st Carniolan Honey bee st
Druge <i>Others</i>	-	
TUJERODNE EXOTIC BREEDS	-	
Razširjene <i>Widely used</i>	-	
Druge <i>Others</i>	-	

st = stabilno, de = zmanjševanje, in = povečevanje
st = stable, de = decreasing, in = increasing

Poleg vseh naštetih pasem po posameznih vrstah domačih živali so na območju Republike Slovenije občasno tudi druge vrste in pasme domačih živali, ki jih nismo posebej navajali. Te so pogosto le občasno prisotne ali pa jih je le po nekaj glav (npr. istrsko govedo, kraška sivka, belgijsko beloplavno govedo, istrski osel, oplemenjena bovška ovca, noji, lame, slovenski kuneč, oldenburški, holštajnski, trakenski in bavarški toplokrvni konji, vzhodnofrizijski konj ter konji nekaterih toplokrvnih pasem iz vzhodne Evrope in različne pasme ponijev).

Za zadovoljevanje prehranskih potreb je v Sloveniji razvito tudi komercialno ribištvo, pretežno v morskih vodah in manj v sladkovodnih. V letu 2001 je po podatkih SURS-a morski ulov rib znašal 1669 t, od tega je bilo ulovljenih 1537 t plavih in 132 t drugih rib. Sladkovodni ulov rib v istem letu je bil za 244 t manjši od morskega. Ulov in vzreja sladkovodnih rib v ribogojnicah sta v letu 2001 znašala 1107 t.

Živeči divji predniki domačih živali v Sloveniji

Od divjih prednikov domačih živali sta v Sloveniji prisotna muflon (*Ovis musimon*) in divji prašič (*Sus scrofa*). V skladu s Strategijo ohranjanja biotske raznovrstnosti v Sloveniji je usmerjanje gospodarjenja z divjadjo in njihovim življenjskim okoljem v Sloveniji institucionalno in normativno dobro urejeno. Desetletne in letne lovskogojitvene načrte lovskogojitvenih območij izdeluje javna gozdarska služba, s čimer je zagotovljena celovitost usmerjanja gozdnih ekosistemov.

Together with the above breeds, certain other species and breeds can also be found in Slovenia that have not been mentioned separately. These are present only occasionally and in very low numbers (e.g. Istrian cattle, Karst Sivka cattle, Belgian Blue, Istrian ass, Improved Bovec Sheep, ostriches, llamas, Slovenian rabbit, Oldenburg, Trakehner, Holstein, and Bavarian warm-blooded horse, East-Friesien horse, and horses of some warm-blooded breeds from eastern Europe, and several different breeds of ponies).

The commercial fishing industry, mostly marine and to lesser extent freshwater fishing, is also important in meeting nutritional needs in Slovenia. According to SORS data, the marine fish catch amounted to 1,669 t in 2001, with 1,537 t of "blue fish" and 132 t of other fish species. The freshwater catch was 244 t less than the marine catch. The catch and production of freshwater fish in fish farms amounted to 1,107 t in 2001.

Wild ancestors of farm animals in Slovenia

1.2.1.1

The Mouflon (*Ovis musimon*) and Wild boar (*Sus scrofa*) are the only wild ancestors of Slovenian farm animals. According to the Biodiversity Conservation Strategy of Slovenia, directions on the management of game and its living environment are well regulated at the institutional and normative levels. The ten-year and annual plans for game breeding and hunting in specific hunting and breeding areas are drawn up by the public forestry services. In this way, the integrity of forest ecosystems is guaranteed.

1.2.1.2

Is there a danger of genetic erosion?

The introduction of more profitable breeds in past decades has brought about a gradual disappearance of less productive Slovenian autochthonous breeds or their fusion with newly introduced breeds. Animal husbandry now involves fewer and fewer autochthonous breeds, and some breeds have thus been lost completely. Some other breeds still exist but only as the last remnants of their kind. We have thus lost a part of the biodiversity in some species of farm animals.

Biodiversity in animal husbandry has been strongly affected by the ever increasing loss of agricultural lands (overgrowing, urbanization of land etc.). All this has an impact on rural ecosystems and a negative influence on the diversity of agricultural genetic resources.

15

Preglednica / Table

Izgubljene lokalno prilagojene pasme domačih živali po posameznih vrstah v zadnjih petdesetih letih Locally adapted breeds that have been lost, presented by respective species in the period of the last 50 years

Vrsta Species	Štev. pasem No. of breeds	Pasma Breed
Govedo Cattle	2	marijadovsko govedo, pomursko ali pšenično govedo Slovenian White, Pomurska (Murboden) Cattle
Koze Goats	1	domača križana koza Slovenian crossbreed goat
Konji Horses	1	medžimurski konj Međimurje horse
Prašiči Pigs	2	beli plemeniti prašič, beli požlahtnjeni prašič Improved White pig, Improved Landrace pig
Kokoši Chicken	*	štajerska kokoš (variacije: grahasta, bela, rjava) Styrian hen (variation: barred, white, brown)

*Pasma je ohranjena, izgubljene so le naštete variacije. * The breed has been preserved, the listed variations are lost.

1.2.2

The state of knowledge of AnGR

Information on the inventory of breeds within a particular animal species has been arranged on the basis of the significance of the species in agricultural production. The inventory is more accurate for breeds that are more important for food production and those given a higher level of production and selection management. With species and breeds of economic importance, we monitor the number of animals as well as their economically important traits.

Current information on breeds has been included in the Domestic Animal Diversity Information System (DAD-IS). In 2001, the DAD-IS data were refreshed and updated. This information system should permit and facilitate direct access, updates and maintenance of data. Updates should in the future be displayed immediately after the input.

Nevarnost genske erozije domačih živali v Sloveniji

Uvajanje gospodarsko donosnejših pasem v zadnjih desetletjih je povzročilo, da manj proizvodne slovenske avtohtone pasme izginjajo ali pa so pretopljene z novimi. Tako je v rejo domačih živali vključenih vedno manj avtohtonih pasem, zaradi česar smo jih nekaj tudi izgubili, od drugih pa so se ohranili le ostanki. Tako smo izgubili del biotske raznovrstnosti pri posameznih vrstah domačih živali.

Na zmanjševanje biotske raznovrstnosti v živinoreji močno vpliva izgubljanje kmetijskih zemljišč (zaraščanje, urbanizacija idr.), kar vpliva na stanje kmetijskih ekosistemov, negativno pa tudi na pestrost kmetijskih genskih virov.

Stanje poznavanja ŽGV

Informacije (število informacij) o statusu pasem znotraj posameznih vrst živali so zbrane na podlagi pomembnosti pasme za prirejo in kmetijstvo. Informacije o statusu so točnejše za pasme, ki so pomembnejše za prirejo hrane, saj je pri teh pasmah raven rejskega in seleksijskega dela višja. Za gospodarsko pomembne vrste in pasme živali spremljamo poleg števila živali tudi gospodarsko pomembne lastnosti.

Informacije o pasmah so vključene v informacijski sistem raznovrstnosti domačih živali (DAD-IS). V letu 2001 so bili podatki v DAD-IS obnovljeni in dopolnjeni. Informacijski sistem bi moral omogočiti neposreden dostop za dopolnjevanje oz. popravljanje podatkov. Zagotavljati bi moral, da bi bili popravki vidni takoj po vnosu.

Pri zbiranju informacij o statusu živalskih genskih virov (ŽGV) nimamo težav, vsaj glede gospodarsko pomembnih pasem in vrst, ker to spodbuja in sofinancira tudi država. Pri pasmah, ki se pojavljajo le v ljubiteljski rejah, je največja težava pomanjkanje strokovnih in drugih informacij – npr. ljubiteljske reje kuncev in perutnine.

Za izboljšanje znanja bo treba poenotiti informacijske sisteme in vpeljati sistem za monitoring. Sistemi zbiranja podatkov so: sistem obveznega individualnega označevanja goved, sistem kontrole proizvodnih lastnosti in selekcije pri govedu, drobnici, prašičih, perutnini in deloma tudi pri kuncih ter pri konjih.

V skladu z Zakonom o živinoreji se monitoring, tj. sistematično spremljanje in analiziranje stanja biotske raznovrstnosti, izvaja kot javna služba nalog genske banke v živinoreji. Način izvajanja monitoringa biotske raznovrstnosti v živinoreji predpiše kmetijski minister.

Programi in strategije ohranjanja

Biotska raznovrstnost v živinoreji je sestavni del Strategije ohranjanja biotske raznovrstnosti v Sloveniji, ki jo je sprejela Vlada Republike Slovenije v letu 2001 (izdajatelj in založnik Ministrstvo za okolje, prostor in energijo, marec 2002) in ima svojo podlago v Konvenciji o biološki raznovrstnosti (Republika Slovenija jo je ratificirala v letu 1996) in v usklajevanju slovenskega pravnega reda s pravnim redom EU.

Program Ohranjanje biotske raznovrstnosti v živinoreji v Sloveniji 2001-2008

Z izvajanjem programov ohranjanja ŽGV pri avtohtonih pasmah se po letu 1991 pospešeno in načrtno ukvarja skupina raziskovalcev z Oddelka za zootehniko Biotehniške fakultete Univerze v Ljubljani. Znotraj skupine poteka program Ohranjanje biotske raznovrstnosti v živinoreji v Sloveniji, ki obsega vse potrebne korake za zavarovanje ogroženih avtohtonih pasem: popis, ugotovitev stanja in ogroženosti, možne načine samega ohranjanja.

Finančni viri za delo pri ohranjanju avtohtonih pasem temeljijo na predloženem programu Ministrstva za kmetijstvo, gozdarstvo in prehrano (MKGP). V letu 2001 je bil sprejet program Ohranjanje biotske raznovrstnosti v živinoreji v Sloveniji za obdobje 2001-2008.

We have no problems in collecting information on the inventory of AnGR, at least in the case of economically important breeds and species. This is, namely, also encouraged and partly financed by the government. However, there are some issues of the lack of professional and other information, especially in relation to breeds that are kept only by fanciers, e.g. fancy breeding of rabbits and poultry.

To improve knowledge, we will have to unify information systems and introduce a new monitoring system. The following systems are used for data collection: the system of mandatory individual identification of cattle, the system of production control traits and selection in cattle, small ruminants, pigs, poultry, and to some extent also in rabbits and horses.

According to the Livestock Breeding Act, monitoring (i.e. systematic monitoring and analysing the state of biodiversity) is conducted as a public service within the scope of the gene bank in animal husbandry. The method of monitoring biodiversity in animal husbandry is directed by the agricultural minister.

Programs and conservation strategies

1.2.3

Biodiversity in animal husbandry is a constituent of the Biodiversity Conservation Strategy of Slovenia enacted by the Government of the Republic of Slovenia (RS) in 2001 (published by the Ministry of the Environment, Spatial Planning and Energy, March 2002) and has its basis in the Convention on Biological Diversity (ratified by the RS in 1996) and in the harmonization of Slovenian legislation with the *acquis communautaire*.

Program Conservation of biodiversity in animal husbandry in Slovenia 2001-2008

1.2.3.1

Implementation of the programs for the conservation of farm animal genetic resources in autochthonous breeds has been conducted very intensively and purposefully since 1991 by a group of researchers at the Zootechnical Department of the Biotechnical Faculty of the University of Ljubljana. The group conducts a program of "Conservation of biodiversity in animal husbandry in Slovenia", in which all the necessary steps for the conservation of endangered autochthonous breeds are included: inventory, assessment of the state and level of threat, possible means of conservation.

Financial resources for activities in the field of conservation of autochthonous breeds are based on the program presented by the Ministry of Agriculture, Forestry and Food (MAFF). In 2001, a program for "Conservation of biodiversity in animal husbandry in Slovenia" was adopted for the period 2001-2008.

State of *in situ* conservation

The Livestock Breeding Act, which was adopted on 12 February 2002, officially regulates biodiversity in animal husbandry in Chapter 6: Conservation of genetic variability and genetic reserves of domestic animals. In Article 68, autochthonous breeds are listed by individual species of domestic animal (those that have been included in the program of conservation of biodiversity in animal husbandry in Slovenia):

Horses: Lipizzan horse, Slovenian Cold-Blooded horse, Posavje horse;

Cattle: Cika cattle;

Sheep: Bovec sheep, Istrian Pramenka, Bela Krajina Pramenka, Jezersko-Solcava sheep;

Goats: Dreznica goat;

Pigs: Krsko Polje pig;

Chickens: Partridge Styrian hen;

Fish: Marble trout;

Honey bees: Carniolan Honey bee;

Dogs: Karst Shepherd, Posavec hound, Istrian Smooth-coated hound, Istrian Rough-coated hound and the Slovenian Mountain hound.

Slovenske
avtohtone pasme



Slovenian
autochthonous breeds



In 2001, the program of conservation of biodiversity in animal husbandry in Slovenia comprised more than 3200 individual farm animals of all species, kept by more than 300 owners (breeders and producers). Rearing in the original autochthonous environment is being encouraged. Inclusion of each animal in the program entails a special contract that binds the owner to fulfil all required conditions. In this manner the owners are then entitled to receive an annual subsidy

Stanje ohranjanja *in situ*

V Sloveniji je biotska raznovrstnost v živinoreji urejena z Zakonom o živinoreji, sprejetim 12. 2. 2002, in sicer v njegovem šestem poglavju: Ohranjanje genetske variabilnosti in genetske rezerve domačih živali. V drugi alineji 68. člena so naštete avtohtone pasme po vrstah domačih živali (vključene v program Ohranjanje biotske raznovrstnosti v živinoreji v Sloveniji):

konji: lipicinski konj, slovenski hladnokrvni konj, posavski konj;

govedo: cikasto govedo;

ovce: bovška ovca, istrska pramenka - istrijanka, belokranjska pramenka, jezersko-solčavska ovca;

koze: drežniška koza;

prašiči: krškopoljski prašič;

kokoši: štajerska kokoš (variacija: jerebičasta);

ribe: soška postrv;

čebele: kranjska čebela;

psi: kraški ovčar, posavski gonič, kratkodlaki istrski gonič, resasti istrski gonič in slovenski planinski gonič.

V letu 2001 je bilo v program Ohranjanje biotske raznovrstnosti v živinoreji v Sloveniji vključenih nad 3 200 domačih živali po posameznih vrstah in pasmah pri več kot tristo rejcih. Spodbujamo rejo v avtohtonem okolju, rejci pa imajo za vsako žival, ki jo želijo vključiti v program ohranjanja, sklenjeno pogodbo, ki jih zavezuje k izpolnjevanju predpisanih pogojev. Tako so upravičeni do vsakoletne premije, ki jo izplača Ministrstvo za kmetijstvo, gozdarstvo in prehrano.

Število živali, vključenih v program ohranjanja po posameznih vrstah domačih živali (2001)
Number of animals in conservation programme by species and subsidy per animal (2001)

Vrsta Species	Število živali v genski banki No. of animals in gene bank	Število rejcev No. of breeders	Podpore na žival, vpisano v rodovniško knjigo Subsidy per animal in herdbook (USD)
Konji Horses	320	185	102
Govedo Cattle	150	96	102
Prašiči Pigs	37	3	144 (merjasci/ Boars) 102 (svinje in mladice/ Sows and gilts)
Ovce Sheep	2570	57	29 (mlečne pasme/ Dairy breeds) 20 (mesne pasme/ Meat breeds)
Koze Goats	183	26	20
Kokoši Chicken	186	4	4.4

Prav tako imajo rejci možnost pridobiti tudi investicijsko podporo za ureditev infrastrukture.

Strokovno delo vodi Oddelek za zootehniko Biotehniške fakultete Univerze v Ljubljani, ki vodi oz. sodeluje pri načrtovanju in izvajaju nacionalnih selekcijskih programov za posamezne vrste domačih živali. Pri monitoringu in izvajaju rejskih opravil sodelujejo tudi druge ustanove.

Po posameznih vrstah so reje razporejene po določenih kakovostnih razredih v skladu z rejskimi programi (podrobnejše glej poglavji 1.3 in 1.4).

Stanje ohranjanja *ex situ*

V Sloveniji so narejeni prvi koraki za sistematično ohranjanje biotske raznovrstnosti ŽGV *ex situ*. Program ohranjanja se v obliki zamrznjenega semena v Sloveniji izvaja pri govedu. V program so vključene slovenska rjava, črno-bela, cikasta, šarole, limuzin in belgijska belop lava pasma goved. Pri konjih, prašičih in drugih vrstah so shranjene le poskusne doze semena.

Sistematično je urejeno shranjevanje DNA pri konjih lipicanske pasme v okviru dveh raziskovalnih projektov: Slovenski lipicanec in INCO/Copernicus. Shranjenih je nekaj vzorcev DNA pri nekaterih pasmah (posavski konj, bovška ovca, istrska pramenka, jezersko-solčavska ovca).

Pri ribah imamo sorazmerno obsežno zbirko tkiva (košček plavut v alkoholu) in vzorcev DNA za nekatere salmonidne vrste (potočna postrv, soška postrv, lipan). Načrtuje se povečanje zbirke z vzorci sulca.

from the MAFF. The owners may also receive additional financial assistance for investment in infrastructure.

Professional activities are performed by the Zootechnical Department of the Biotechnical Faculty, University of Ljubljana. The department is in charge of the national selection programme for individual species of farm animals. Some other institutions also take part in monitoring and in performing activities related to production. For particular species, farming is arranged into quality categories that are in line with breeding programs (for details see Chapters 1.3 and 1.4).

Status of *ex situ* conservation

1.2.5

Slovenia has made first steps towards the systematic *ex situ* conservation of AnGR biodiversity. The program of conservation in the form of frozen semen is in Slovenia performed only for cattle. The following breeds are included in the program: Slovenian Brown, Black and White, Cika, Charolais, Limousine, and Belgian Blue. Only the experimental quantities of semen have so far been collected and preserved from horses and other species.

DNA has been systematically preserved for Lipizzan horses in the frame of two research projects: Slovenian Lipizzan and INCO/Copernicus. Some DNA samples have been collected and preserved from particular breeds (Posavje horse, Bovec sheep, Istrian Pramenka, Jezersko Solcava sheep).

In fish we have compiled a fairly comprehensive collection of tissues (small pieces of fins in alcohol) and DNA samples from some salmonids (Brown trout, Marble trout, Grayling). An expansion of huchen samples collection is also in preparation.

1.3 ASSESSING THE STATE OF UTILIZATION OF FARM AnGR

1.3.1

Policy and legal instruments which affect use of AnGR

The management of AnGR in Slovenia is to an important extent regulated by the Livestock Breeding Act. A smaller part of this field is also regulated by the Agriculture Act. Those fields of AnGR management that are linked to biodiversity conservation by taking into account the sustainable use of natural resources in terms of the structural policy of the EU, are managed by the Slovenian Agro-Environmental Programme (SAEP). This program is based on Slovenian legislation, as well as EU regulations. A smaller part of the field of management of AnGR is also dependent on decrees outlining measures of agricultural market-price policy (5 decrees) and on the Decree on the implementation of agricultural policy measures. Both Acts and all the above decrees are harmonized with the *acquis communautaire*.

In Slovenia, 11.3 mio EUR are allocated annually to the sector for recording production traits, selection and reproduction of all farm animal species. The Government contributes 70 %. Producers furnish a further 30 %.

Livestock Breeding Act

1.3.1.1

The Livestock Breeding Act has enacted the principles of the breeding of farm animals. These principles, in accordance with the goals of agricultural policy, outline the economic, spatial, ecological and social roles of animal husbandry and sustainable development in agriculture. The act directs the manners and procedures of livestock breeding, methods and procedures of testing, biodiversity conservation of farm animals, nutrition of animals, manners and procedures of adopting of breeding and selection programs, and furnishes basic requirements for assessing and ranking breeding animals as a market quality category. The following are the principal objectives of the act:

- regulating the field of animal husbandry, with the aim of improving it as an important activity of stable production of quality food and providing food safety,
- conservation of settlements in rural areas, prevention of overgrowing and conservation of the cultivated landscape,

OCENA STANJA RABE ŽGV

Politična in zakonska ureditev v povezavi z ŽGV

Zakonodaja v Republiki Sloveniji z Zakonom o živinoreji v veliki meri ureja rabo ŽGV. Manjši del tega področja ureja tudi Zakon o kmetijstvu. Tista področja rabe ŽGV, ki so povezana z ohranjanjem biotske raznovrstnosti ob upoštevanju sonaravne rabe naravnih virov v smislu strukturne politike EU, ureja SKOP, ki ima pravno podlago v slovenski zakonodaji in predpisih EU. Manjši del področja rabe ŽGV pa je odvisen tudi od uredb, ki določajo ukrepe kmetijske tržnocevnovne politike (5 uredb), ter Uredbe o izvedbi ukrepov kmetijske politike. Oba zakona in vse omenjene uredbe so usklajene s pravnim redom EU.

V Republiki Sloveniji namenjamo vsako leto kontroli proizvodnih lastnosti, selekciji in reprodukciji vseh vrst živali 11,3 mio. EUR, od tega je prispevek države 70 %, prispevek rejcev pa 30 %.

Zakon o živinoreji

Zakon o živinoreji je uzakonil načela reje domaćih živali, ki v skladu s cilji kmetijske politike določajo gospodarsko, prostorsko, ekološko in socialno vlogo živinoreje in kmetijstva ter njegovega sonaravnega razvoja. Zakon ureja načine in postopke reje, načine in postopke testiranja, ohranjanje biotske raznovrstnosti v živinoreji, prehrano živali, načine in postopke sprejemanja rejskih in seleksijskih programov ter predpisuje osnovne zahteve za ocenjevanje in razvrščanje plemenskih živali kot tržne kakovostne kategorije. Glavni cilji zakona so:

- urejanje živinoreje zaradi izboljšanja te gospodarske panoge, ki je pomembna za stabilno pridelavo kakovostne hrane in zagotavljanje prehranske varnosti,
- ohranjanje poseljenosti podeželja, preprečevanje nadaljnjega zaraščanja in ohranitev kulturne krajine,

- izkoriščanje naravnih zmogljivosti za prirejo hrane ob upoštevanju trajnostnega in sonaravnega razvoja in ohranjanja proizvodnih zmogljivosti ter rodovitnosti zemlje,
- urejanje načinov in meril za delovanje priznanih rejskih organizacij in meril za izvajanje skupnega temeljnega rejskega programa,
- zagotavljanje višje ravni izobrazbe v živinoreji,
- zagotavljanje biotske raznovrstnosti v živinoreji ter spoštovanje načel varstva okolja in ohranjanja narave,
- zagotavljanje primerne dohodkovne ravni kmetijskim gospodarstvom.

Temeljni cilj zakona je prilagoditev slovenske zakonodaje s področja živinoreje zakonodaji EU in razmeram skupne kmetijske politike EU. Zakon daje sistemsko podlogo za dolgoročno načrtovanje in razvoj živinoreje, učinkovito in celovito izvajanje ukrepov na skupnem evropskem trgu ob upoštevanju posebnosti slovenskih razmer.

Zakon temelji na načelih skladnosti, nevtralnosti in enakopravnosti ukrepov, tako da je zagotovljena enakopravnost upravičencev, ki izpolnjujejo predpisane pogoje, pri uveljavljanju oziroma izvajanjui ukrepov rejskih programov.

Slovenski kmetijsko okoljski program

Slovenski kmetijsko okoljski program (SKOP) spodbuja ohranjanje in uveljavljanje takih načinov živinoreje, ki zagotavljajo sonaravno rabo naravnih virov, ohranjajo biotsko pestrost rastlinskih sort, živalskih vrst in pašem ter varujejo naravno in kmetijsko krajino ob sočasnem trajnostnem razvoju podeželja. SKOP podpira okoljsko funkcijo živinoreje in jo hkrati prilagaja tudi zahtevam varovanja okolja v EU. Pomembno je tudi, da SKOP z nekaterimi ukrepi, kot so spodbujanje košnje na strmih in grbinastih travnikih, ohranjanje obdelane in poseljene krajine na zavarovanih območjih, planinska paša ..., pomembno prispeva k preprečevanju zaraščanja in ohranitvi poseljene in kulturne krajine.

- utilization of natural resources for food production by paying attention to sustainable development and maintaining the productive capacity and fertility of land,
- managing ways and criteria for operation of recognized breeding organizations and criteria for implementing the joint basic breeding programme,
- providing a higher level of appropriate education in the field of animal husbandry,
- maintaining biodiversity in animal husbandry and respecting the principles of environmental protection and preservation of nature,
- providing a suitable income for those involved in agriculture.

The principal objective of the act is to harmonize Slovenian livestock breeding legislation with the *acquis communautaire* and to adapt to the Common Agricultural Policy. The act provides a systemic basis for long-term planning and development in animal husbandry, efficient and integrated implementation of measures on the common European market while paying attention to Slovenian specifics.

The act is based on the principles of harmony, neutrality and parity of measures so that equal status is provided to those claimants who fulfil prescribed conditions to bring into force and to perform breeding and production programs.

Slovenian Agro-Environmental Programme

1.3.1.2

The Slovenian Agro-environmental program (SAEP) stimulates maintenance and endorsement of such animal production methods as guarantee the sustainable utilization of natural resources, preserve biodiversity of both plant and animal species, varieties or breeds, and which protect the natural and agricultural landscape by maintaining sustainable rural development. SAEP assists the environmental utility of animal husbandry. SAEP supports animal husbandry activities in their environmental function and, at the same time, adjusts these activities to the environmental protection requirements of the EU. The special significance of SAEP is in its contribution, through certain measures such as encouragement of hay harvesting on sloping and rough meadows, conservation of cultivation and rural settlement patterns in protected areas, mountain pastures etc., preventing overgrowing of agricultural lands and preserving rural settlements and cultured landscape.

1.3.1.3

Measures of agricultural market-price policy

Regulations concerning measures of agricultural market-price policy and a Decree on the implementation of agricultural policy measures are issued in Slovenia every calendar year. Five decrees are important in the frame of the Measures of agricultural market-price policy in the field of AnGR (Decree on the organisation of the market in beef, Decree on the organisation of the market in sheep meat and goat meat, Decree on direct payments for breeding mares and direct payments for hives of bees, and Decree on direct payments for rearing pure-bred breeding animals). The Decree on the implementation of agricultural policy measures with regard to utilization of AnGR promotes rearing of breeding animals and is harmonized with the *acquis communautaire*. Direct payments, according to this decree, apply to part of the production-traits-testing of breeding animals and to breeding and rearing of breeding animals.

Both legislation and agricultural policy in the RS stimulate efforts for preserving as high AnGR diversity as possible, respecting the fact that they do not promote or obstruct expansion of individual breeds or even animal species. However, it is important to recognise that the legislation and decisions of the agricultural policy in the Republic of Slovenia are in harmony with the *acquis communautaire*.

1.3.2

The state of use of AnGR (by species)

Farm animal species in Slovenia vary in importance, given the substantial share of grassland in the structure of agricultural lands and the substantial share of lands with unfavourable conditions for cultivation. Horses and ruminants, especially cattle, are the most important farm animals in terms of utilization of this type of land.

Consumers of animal products and the food industry indirectly influence the intensity of utilization of a particular species or breed. Consumers' influence is present most strongly in meat production, and least in milk production (milk production is growing constantly, with per capita consumption, however, showing a very modest growth). The demands of Slovenian consumers with regard to standards of quality are becoming increasingly similar to those in neighbouring countries; however, the consumption of individual animal products per capita remains different from that in the EU.

The importance of exotic breeds (cattle, pigs, poultry) has been increasing for the last two or three decades

Ukrepi kmetijske tržnocenovne politike

V Sloveniji so vsako koledarsko leto izdane uredbe o ukrepih kmetijske tržnocenovne politike in Uredba o izvedbi ukrepov kmetijske politike. Pri ukrepih kmetijske tržnocenovne politike je za področje ŽGV pomembnih pet uredb (Uredba za ureditev trga za goveje meso, Uredba o ureditvi trga za ovče in kozje meso, Uredba o neposrednih plačilih za kobile za vzrejo žrebet in o neposrednih plačilih za gospodarske čebelje družine ter Uredba o neposrednih plačilih za rejo plemenskih živali). Uredba o izvedbi ukrepov kmetijske politike z vidika uporabe ŽGV spodbuja rejo plemenskih živali in je usklajena z zakonodajo EU. Neposredna plačila se po tej uredbi nanašajo na del testiranja proizvodnih lastnosti plemenskih živali ter na vzrejo in rejo plemenskih živali.

Zakonodaja in kmetijska politika v Republiki Sloveniji spodbujata prizadevanja za ohranitev čim večje pestrosti ŽGV ob dejstvu, da vsaj neposredno ne pospešuje in tudi ne zavirata širjenja posameznih pasem ali celo vrst živali. Pomembna pa je ugotovitev, da so zakonodaja in odločitve kmetijske politike v Republiki Sloveniji usklajene s pravnim redom EU.

Stanje rabe ŽGV (po vrstah)

Glede na velik delež travinja v sestavi kmetijskih zemljišč in velik delež kmetijskih zemljišč s težjimi (omejenimi) pridelovalnimi razmerami je pomen posameznih vrst živali v Sloveniji različen. S tega vidika imajo največji pomen konji in prežvekovalci, med njimi je najpomembnejše govedo.

Tudi porabniki živalskih proizvodov in živilska industrija posredno vplivajo na večjo ali manjšo uporabo posamezne vrste in tudi pasme domačih živali. Ta vpliv porabnikov se najmočneje kaže pri prireji mesa in najmanj pri prireji mleka (prireja mleka se stalno povečuje, poraba na prebivalca pa se pomembno ne povečuje). Navade slovenskih porabnikov živalskih proizvodov se glede kakovostnih norm vse bolj enačijo z zahtevami porabnikov v sosednjih državah, poraba posameznih živalskih proizvodov na prebivalca pa je v primerjavi z EU precej različna.

V zadnjih dveh, treh desetletjih je zaradi velike intenzivnosti prireje naraščal pomen tujerodnih pasem domačih živali (govedo, prašiči, perutnina). Pri drobnici in konjih so bile za prirejo hrane in kmetijstvo

najpomembnejše lokalno prilagojene (avtohtone in tradicionalne) pasme. Trenutno narašča pomen lokalno prilagojenih pasem pri govedu, nekoliko manj pa tudi pri prašičih in perutnini. Pri vseh vrstah živali pa se povečuje število živali in pasem, ki se na novo uvažajo v Republiko Slovenijo.

because of strong intensification of animal production. In small ruminants and horses, most emphasis in production of food and agriculture has been placed on locally adapted breeds (autochthonous and traditional). Currently, the importance of locally adapted breeds is growing in cattle, and to some extent also in pigs and poultry. The number of new imports of animals and breeds to Slovenia is growing in all species.



Cattle

1.3.2.1

Cattle production technologies in Slovenia are conditioned by the characteristics of a particular area and by infrastructure.

Milk production in the last decade has been moving towards lowlands with well organized infrastructure. This facilitates intensification of production. Only a small share of milk production is conducted in the more remote mountainous areas, on permanent pastures and some mountain pastures. Changes in the field of milk production also strongly impact on the production of beef and veal. Beef production spreads on mountain pastures and absolute grassland mainly through suckler cows rearing. In the last decades, two separate systems have evolved: milk and meat production respectively. This has also conditioned the development of breeding systems or breeding programs, despite the fact that the dual purpose Simmental breed accounts for almost 60 % of all cattle.

Breeding programs for breeds used primarily in **milk production** include several technological, information and biotechnological tools in order to improve economically important traits. All sires that are used for artificial insemination or natural mating are performance tested. Those used for artificial insemination have also been tested for economically important traits in progeny. Sixty percent of all cows included in market milk production have been involved in the planned recording of production traits. Breeding values (BV) are continuously calculated for all animals. Biotechnological methods are also used to evaluate specific characteristics (genotype of kappa-casein). Information technologies are employed in information transfer, recording production data and in publishing BV. In recent years, information technologies have also been used in SIR (identification and registration of cattle).

Beef and veal production, in comparison with milk production, involves fewer of the modern breeding and biotechnological methods. All bulls of the dual-purpose Simmental breed and partially also Slovenian Brown breed, and beef breeds that are used for artificial insemination are tested for growth and carcass traits. Breeding value is also continuously calculated. Only with some beef cows are beef production traits recorded. Biotechnological methods for testing growth and carcass traits have not yet been introduced. The



Govedo

Tehnologije reje goved se v Sloveniji razlikujejo glede na naravne danosti in infrastrukturne možnosti.

Prireja mleka se v zadnjem desetletju večinoma seli na nižinska območja z urejeno infrastrukturo, kar omogoča hitrejše intenziviranje prireje mleka. Le manjši del prireje mleka ostaja na odročnejših hribovitih, absolutno travnatih površinah in na nekaterih planinah. Kot posledica dogajanj pri prireji mleka prihaja do precejšnjih sprememb pri prireji govejega mesa. Na izpraznjena hribovita, absolutno travnata območja se vse bolj širi reja krav dojilj in s tem prireja govejega mesa. Tako sta se v Sloveniji v zadnjem desetletju vse jasneje obliskovala dva proizvodna sistema: prireja mleka na eni strani in prireja govejega mesa na drugi. Posledično so se tako obliskovali tudi rejski sistemi oz. rejski programi, čeprav je v Sloveniji delež kombinirane lisaste pasme skoraj 60-odstoten v sestavi vseh goved.

Pri **prireji mleka** vključujejo rejski programi pri pasmah, ki se še zlasti uporabljajo za prirejo mleka, številna tehnološka, informacijska in biotehnološka orodja, ki pripomorejo k hitrejšemu izboljševanju gospodarsko pomembnih lastnosti. Vsi biki, ki jih uporabljam za osemenjevanje ali za naravni prilust, imajo opravljen lastni test, biki, ki jih uporabljam za umetno osemenjevanje, pa tudi teste gospodarsko pomembnih lastnosti na potomstvu. Okrog 60 % vseh krav, ki so vključene v sistem tržne prireje mleka, je vključenih v načrtno kontrolo proizvodnih lastnosti. Za vse živali stalno izračunavamo plemenske vrednosti (PV), pri ugotavljanju nekaterih lastnosti (genotip kapa kazeina) pa uporabljam tudi biotehnološke metode. Informacijske tehnologije uporabljam pri pretoku in posredovanju informacij, rezultatov kontrol in pri prikazovanju plemenskih vrednosti. Na sodobne informacijske tehnologije smo v zadnjih letih prešli tudi pri identifikaciji in registraciji goved (SIR).

Pri **prireji govejega mesa** je uporaba sodobnih rejskih in biotehnoloških metod v primerjavi s prirejo mleka precej manj obsežna. Vsi biki kombinirane lisaste in deloma tudi rjave pasme ter mesnih pasem, ki jih uporabljam za osemenjevanje, so testirani na lastnosti rasti in lastnosti klavne kakovosti. Temu sledi tudi stalno izračunavanje PV. V kontrolo proizvodnih lastnosti je pri prireji mesa vključen le del krav mesnih pasem. Biotehnoloških metod pri testiranju na pitovne

in klavne lastnosti še ne uporabljamo. Uporaba informacijskih tehnologij je pri priteji govejega mesa enaka kot pri priteji mleka.

Pri priteji mleka se nadaljuje povečevanje mlečnosti po kravi molznici, posledično se povečuje delež črno-bele pasme zaradi zmanjševanja slovenskega rjavega goveda. Delež kombinirane lisaste pasme se ne spreminja; čeprav ne vzdrži konkurenčnega boja pri priteji mleka, se del populacije te pasme vse bolj usmerja v sonaravne načine priteje mleka in predvsem priteje govejega mesa.

Glede na vse večji pomen klavne kakovosti in kakovosti govejega mesa se bo v Sloveniji povečeval delež goved mesnega tipa. Predvidevamo povečevanje mesnih pasem v sistemih gospodarskega križanja in pri reji krav dojilj.

Zakonodaja in kmetijska politika podpirata genetski napredok pasem predvsem s (so)financiranjem kontrole proizvodnih lastnosti, omogočanjem uporabe semena priznanih bikov pod enakimi pogoji za vse rejce ter s financiranjem vzdrževanja osnovnega zdravstvenega varstva populacij goved v Sloveniji. V prihodnje pričakujemo postopno zmanjševanje deleža države pri programih izboljševanja gospodarsko pomembnih lastnosti populacij goved in povečevanje pomena oz. odločitev rejcev prek njihovih rejskih organizacij.

Uvedba kvot pri priteji mleka, vse strožji ekološki normativi in prehranska varnost bodo v prihodnje ena ob pomembnih sestavin pri uporabi ŽGV. Ti dejavniki bodo vplivali na spremembe proizvodnih sistemov v govedoreji, s tem pa posredno tudi na uporabo ŽGV. Podobne spremembe lahko pričakujemo tudi zaradi vpliva nekaterih posebnih proizvodov, ki izhajajo iz posebnih proizvodnih sistemov (priteja mleka na planinah, priteja mesa na paši, priteja mesa volov ...).

extent of the use of information technologies in beef production equals that of milk production.

Milk yield per dairy cow has been growing continuously and the share of the Black and White breed has also increased at the expense of the Slovenian Brown breed. The share of the dual-purpose Simmental breed remains stable. Even though these cows are not competitive in milk production, they are increasingly included in sustainable milk production and also beef and veal production.

In terms of the significance of carcass and meat quality, we expect the share of beef cattle to grow. We predict the growth of beef breeds in the systems of cross-breeding and in breeding of suckler cows.

Legislation and agricultural policy support genetic development of breeds by subsidizing the recording of production traits, by providing access to quality semen of approved sires to all breeders under equal conditions, and by financially maintaining the system of elementary health management for the entire cattle population in Slovenia. In the future, we expect the involvement of the Government in these activities gradually to diminish. On the other hand, the commitment of breeders as well as the relevant breeders' organizations will need to increase.

Milk quotas and strict environmental guidelines and food safety will in the future play an important role in the use of AnGR. We expect these factors to strongly impact on cattle production systems and relevant AnGR. Similar changes can be expected in specific products from specific production systems (such as milk production on mountain pastures, meat production in pastoral systems, meat production with steers, etc.).



Sheep and goats

Professional activities related to small ruminants were in progress until the 50s of the last century. They then stopped until 1980. In the last 10 years this branch has been developing much more rapidly than other animal husbandry branches. Production remains sustainable to an even greater degree than before. Small ruminants are also increasingly gaining importance as the “shapers” of the cultivated landscape in areas with unfavourable farming conditions. This is production on meadows and pastures and on lands that are overgrown with shrubs or forest. A system of controlled grazing is employed on such lands. There are also a few examples of transhumance (seasonal migration of flocks to highland pastures). Maintenance of highland pastures is being promoted by governmental assistance, such as construction of fences, cheese dairies, sheds, tracks etc. In 1991, there were 30,000 head of small ruminants, and in 2001 there were 120,000, which show a rapid expansion that has not yet abated.

Future growth will involve the number of flocks as well as the number of animals per flock. Market opportunities still exist, since the Slovenian market has not yet become saturated with milk and meat of small ruminants. Professional services, together with breeders, will in the future promote activities towards a higher quality of slaughter lambs. New testing and examination methods will also be introduced. Milk is processed primarily at home and is sold directly to visitors (rural tourism) and small specialized shops. Quality standards will also be improved here so that products can get a better price. The number of animals can grow to 500,000 or 600,000 and can thus take up between 120,000 and 150,000 ha. This is currently the area overgrown by shrubs and trees.

The recording and selection program of small ruminants in Slovenia is almost entirely funded by the Government. Production of breeding stock is promoted by direct payments for each pure-bred breeding animal, by subsidizing acquisition of tested and other breeding rams, and by subsidizing imports which are vital for refreshing the bloodline of some breeds and also for experiments in cross-breeding. Breeders are increasingly joining breeders' organizations, which are taking care of progress and promotion of these activities. This will facilitate presentation and marketing of products, which is not yet well organized due to the non-existence of an organized market.



Ovce in koze

Strokovno delo, povezano z drobnico, je potekalo do petdesetih let prejšnjega stoletja, nato je zamrlo do leta 1980. V zadnjih desetih letih se reja drobnice med vsemi panogami živinoreje najhitreje razvija, pri tem pa ostajajo načini reje in prehrane še bolj kot prej v okvirih sonaravne reje. Ob tem postaja reja drobnice tudi vse pomembnejša “urejevalka” kulturne krajine na območjih s težjimi pridelovalnimi razmerami. Gre torej za rejo na pašnikih in senožetih ter na zaraščajočih se površinah. Pri tem uporabljamo pretežno sistem nadzorovane paše, le nekaj rej uporablja tradicionalno kratko transhumanco (preselitev tropa na planinske in visokogorske pašnike). Tudi urejanje planinskih pašnikov Republika Slovenija podpira s posebnimi državnimi pomočmi (urejanje ograj, sirarn, hlevov, poti itd.). Podatek, da je bilo v Sloveniji leta 1991 30 000 glav drobnice in da se je v letu 2001 njihovo število povečalo na 120 000, kaže na hiter razvoj, ta gibanja pa se še nadaljujejo.

Pri nadalnjem razvoju reje drobnice naj bi se povečevalo število tropov in število živali v tropih. Možnosti za to so, saj slovenski trg še ni zasičen z mesom niti z izdelki iz mleka drobnice. V prihodnje bo strokovna služba skupaj z rejci pospešila delo pri povečanju kakovosti klavnih jagnjet in uvajala nove metode testiranj in meritev. Prireja mleka pri drobnici je namenjena predvsem predelavi na domu in je s tem tesno povezana z neposredno prodajo v kmečkem turizmu ali v specializiranih butičnih prodajalnah. Tudi na tem področju bomo povečevali standarde kakovosti in izboljševali kakovost izdelkov, s katerimi bo mogoče doseči višje cene. Količinsko se lahko reja drobnice v Republiki Sloveniji poveča na 500 do 600 tisoč glav. To bi pomenilo, da bi s to panogo gospodarili na okoli 120.000 do 150.000 ha. Toliko površin imamo zdaj v zaraščanju.

Republika Slovenija skoraj v celoti financira program selekcije in kontrole ter spodbuja rejo plemenskih živali s plačili na plemensko žival, podporo za nakup testiranih in drugih plemenskih ovnov ter s podporami pri uvozu, ki je nujno potreben za osvežitev krvi pri nekaterih pasmah ter tudi za poskuse gospodarskih križanj.

Rejci se vse bolj povezujejo v rejske organizacije in skupaj skrbijo za napredok in uveljavljanje panoge. To jim bo olajšalo tudi ponudbo in prodajo, ki zdaj še nista dobro organizirani, saj ni organiziranega trga.

Konji

Konjereja ima v Sloveniji stoletno tradicijo. Na njenem območju je nastal lipicanec kot najstarejša kulturna pasma konj z znanim porekлом. Njegov nastanek sega v leto 1580, ko je bila v Lipici na Krasu ustanovljena kobilarna za potrebe avstrijskega dvora in španske jahalne šole. Lipicancu je dal osnovo kraški konj. To še najtehtnejše dokazuje dejstvo, da so v začetku, ko so kraške konje že začeli križati z uvoženimi, to pasmo vodili pod imenom "konji kraške pasme lipicanske reje". Lipicanca so izoblikovali s križanjem tedanjih kraških, španskih in neapolitanskih, pozneje pa še kladrubških in arabskih konj. V 19. stoletju se je pasma razširila v številne dežele tedanje avstro-ogrsko monarhije - Hrvaško, Madžarsko, Romunijo, v 20. stoletju pa še v Italijo in Slovaško, kjer so nastale državne kobilarne. Zdaj ga redijo v več kot 27 državah Evrope, Afrike, Amerike in Avstralije.

Kobilarna Lipica redi te konje še dandanes in skupno z Združenjem rejcev lipicanskega konja Slovenije skrbi za rejo tega konja in njegovo uporabo za klasično in športno dresuro ter vožnjo.

Slovenska reja konj je bila razen lipicanca vseskozi usmerjena v rejo težjega delovnega konja za potrebe kmetijstva in gozdarstva. Tako številčno v Sloveniji še danes prevladujejo hladnokrvni kmečki konji, ki sestavljajo okoli 80 % staleža. Med njimi je najbolj razširjen slovenski hladnokrvni konj, nekoliko manj pa še posavski konj, haflinger in norik. Hladnokrvne konje uporabljajo tudi za pitanje in pritejo konjskega mesa za domači trg in izvoz v EU. Stalež hladnokrvnih konj se zadnji dve desetletji počasi zmanjšuje zaradi novih uvoženih toplokrvnih pasem konj, namenjenih športu in rekreatiji. Tako je na osnovi domačih delovnih konj lažjega tipa na območju Ljutomerja že pred sto leti začel nastajati naš kasač, sprva na ruski in pozneje na ameriški krvi. Danes kasači te reje prevladujejo na naših dirkališčih, uspešno pa nastopajo tudi v sosednji Avstriji in Nemčiji. Konec sedemdesetih let smo začeli tudi z rejo hanoveranca, ki je dal osnove za oblikovanje in rejo slovenskega toplokrvnega konja - dobrega večnamenskega jahalnega konja. Od drugih toplokrvnih pasem v manjšem obsegu organizirano redimo za dirke in rekreatijo še polnokrvne angleže in arabce, konje pasme quarter ter islandske ponije. Skupno registrirano redimo v Sloveniji 11 pasem konj.



Horses

1.3.2.3

Horse breeding in Slovenia has had a centuries-long tradition. The Lipizzan horse, which is considered the oldest horse breed of known provenance, comes from Slovenia. Its origins go back to 1580, when a stud farm was established in the area of the Slovenian Karst in order to serve the needs of the Austrian court and the Spanish riding school. The foundation for the Lipizzan horse is the Karst horse, as is demonstrated by the fact that, even after these horses had been cross-bred with imported breeds, they were catalogued under the name of "Horses of Karst breed and Lipica production". The Lipizzan horse was finally shaped by cross-breeding the then existing Karst, Spanish and Neapolitan and later also Kladrub and Arabian horses. In the nineteenth century the breed expanded to the lands of the then Austro-Hungarian Monarchy - Croatia, Hungary, Romania, and in the 20th century to Italy and Slovakia, where state stud farms were established. Today the Lipizzan horse is bred in more than 27 countries of Europe, Africa, America, and Australia.

These horses are still bred today in Lipica. The stud farm, together with the "Slovenian Association of Breeders of the Lipizzan horse" takes care of breeding activities and of the use of this horse in equestrian sports such as classical and sport riding (dressage training), and carriage riding.

Horse breeding in Slovenia, with the exception of the Lipizzan horse, has always been directed towards heavier workhorses for the requirements of agriculture and forestry. So in terms of numbers, cold-blooded horses predominate, accounting for 80 %. The Slovenian cold-blooded horse has the largest share, followed to a lesser extent by the Posavje horse, Haflinger and Norik. Cold-blooded horses are used in fattening for production of horse meat for the domestic market and exports to the EU. The inventory of cold-blooded horses has been slowly decreasing for the last two years and is being supplemented by imports of new warm-blooded breeds used in sports and leisure activities. The autochthonous breed of trotter in the Ljutomer area has evolved during the last hundred years from workhorses of a lighter type. It was initially based on Russian and later on American types. Trotters of this breed are today dominant on our race fields and are also successful in neighbouring Austria and Germany. In the late 70s, we

began to breed the Hannoverian. This breed formed the basis for a good Slovenian multipurpose warm-blooded riding horse. Some other warm-blooded breeds have to a lesser extent also been bred in Slovenia for racing and leisure, such as the Thoroughbred and Arabian horses, Quarter horses, and Icelandic ponies. Eleven horse breeds have now been involved in registered breeding in Slovenia.

Breeding activities, along with the registration of all breeds, has been conducted by the Republic Stud Book Authority at the Veterinary Faculty. The activities are for the moment financed by the MAFF. Sport and leisure, as well as education are conducted by the Equestrian Federation of Slovenia and the Trotter Federation of Slovenia.

Rejsko delo in registracijo za vse pasme opravlja Republiška služba za konjerejo pri Veterinarski fakulteti Univerze v Ljubljani, njeno dejavnost pa za zdaj financira MKGP. Športno dejavnost in izobraževanje za te potrebe pa vodita Konjeniška zveza Slovenije in Slovenska konjeniška akademija.



1.3.2.4

Pigs

After the Second World War, pig production recovered fairly quickly and developed mainly on the small private farms. In 1959, the inventory of pigs was 550,000 head, 98.8 % of them on small private farms. The construction of large farms was launched (between 1958 - 1964). With the introduction of the modern meat-breed Swedish Landrace in 1959, breeding work became mainly centred on these large farms. The production on small private farms became limited to the recognition of boars. Creation of large pig farms provided the means for the continuous market production of pigs, and it contributed significantly to the then existing technologies of pig production. Modern selection was thus made possible. It greatly advanced research and professional activities in this field.

Testing of pigs at the Prevoje progeny test station (between 1961 - 1972) and Ihan test station (from 1975), introduction of insemination (1960), systematic exploration of cross-breeding (with 16 different combinations involved), import of new breeds for cross-breeding (Pietrain in 1964, Belgian Landrace in 1964, Large White in 1967, and German Landrace in 1968), selection of the three-breed crossing 12 x 55, and spread of breeding activities are measures that significantly influenced the breed structure of pigs and the organization of pig production in Slovenia. In 1974, the Republican Committee for Pig Meat Production at the Livestock Production Association of Slovenia was established and special payments for the acquisition of breeding pigs were granted. This committee adopted a breeding program for pigs (1977) and a procedure for testing of pigs (1975). The committee then managed

Prašiči

Po drugi svetovni vojni se je prašičereja v Sloveniji sоразmerno hitro opomogla in se razvijala na kmetijah. V letu 1959 je bil stalež prašičev 550 000 in od tega jih je bilo 98,8 % na kmetijah. Z zgraditvijo prašičerejskih farm v letih 1958 do 1964 in uvozom sodobne mesnate pasme prašičev švedska landras v letu 1959 se je rejsko delo osredotočilo večinoma na farme ter se na kmetijah omejilo na licenciranje merjascev. Zgraditev prašičerejskih farm je omogočila stalno tržno prirejo klavnih prašičev, pripomogla k precejšnji izpopolnitvi tedanjih tehnologij reje prašičev, omogočila sodobno selekcijo prašičev ter spodbudila raziskovalno in strokovno delo v prašičereji.

Testiranje prašičev na progenotestni postaji Prevoje (v letih od 1961 do 1972) in na testni postaji na farmi Ihan (od leta 1975 dalje), uvedba osemenjevanja svinj (1960), načrtne raziskave križanj (proučenih je bilo 16 različnih kombinacij križanj), uvoz novih pasem za križanje (pietrain - leta 1964, belgijska landras - leta 1964, large white - leta 1967, nemška landras - leta 1968), izselekcioniranje tropasemskega križanja 12 x 55 in delitev seleksijskega dela so ukrepni, ki so v zgodnjih sedemdesetih letih precej vplivali tudi na pasemske sestavo prašičev in organizacijo prašičereje v Sloveniji. Leta 1974 je bil ustanovljen republiški odbor za prašičerejo pri Živilnorejski poslovni skupnosti in uvedeno je bilo regresiranje nabave plemenskih prašičev. Odbor je sprejel seleksijski program za prašiče (1977) in postopek testiranja prašičev (1975) ter nato vodil in usmerjal razvoj prašičereje vse do leta 1992. V letu 1982 so za poskuse uvozili novi pasmi duroc in ponovno pietrain, s testiranjem prašičev (merjascev)

pa so začeli še na farmah Nemščak (1980), Ptuj (1986) in Podgrad (1989).

Na farmah je od čistopasemskih prašičev še vedno največ prašičev pasme švedska landras. Poleg tega imajo v manjšem obsegu predvsem za načrtana križanja še pasme large white, nemška landras, pietrain in duroc. Na večini farm in na prašičerejskih kmetijah že več kot dve desetletji uporabljajo za rejo pujskov svinje križanke linije 12 in merjasce nemške landras, po letu 1982 pa tudi merjasce pasem duroc, pietrain in linije 54. V široki reji z uporabo merjascev švedske in nemške landras oplemenjujejo obstoječe populacije prašičev. Leta 1988 so bila v Pomurju ustanovljena prva tri vzrejna središča za plemenske prašiče na kmetijah. Konec leta 2001 je skupaj 41 vzrejnih središč na kmetijah s skupno pribl. 800 čistopasemskimi svinjami.

V Sloveniji redimo prašiče na tri načine:

- **farmska reja prašičev:** imamo osem prašičerejskih farm s skupno zmogljivostjo 335 000 pitancev (100 kg) in plemenskih prašičev na leto oz. 34,8 % celotnega staleža prašičev v Sloveniji. To je visoko produktivna prireja kakovostnih klavnih prašičev. Na farmah dokupujejo 75 % krme. Tod poteka tudi pretežni del selekcije in testiranja prašičev za celotno državo. Na farmah so dobri strokovnjaki, ki imajo veliko vsestranskega in specialističnega znanja o prašičereji;
- **tržna reja prašičev na kmetijah:** razširila se je v zadnjih dvajsetih letih. Zgrajeni oziroma obnovljeni so bili številni objekti in nastale so nove, v prašičerejo usmerjene kmetije. V osnovnih čredah so večinoma svinje linije 12, intenzivnost reje pa je zelo različna in je tesno povezana z vloženim delom strokovnjakov. Pri reji pujskov porabijo približno 70 %, pri pitanju pa 40 % krme, ki jo pridelajo na kmetiji;

- **domača reja prašičev:** domača reja prašičev je še precej razširjena in namenjena predvsem samooskrbi gospodarstev s prašičjim mesom. Vse strokovno delo je omejeno le na obnovo merjascev za naravni pripust.



and directed progress in pig production until 1992. In 1982, the breeds of Duroc and, once again, Pietrain were imported for experimental purposes. The testing of boars also began on farms Nemscak (1980), Ptuj (1986) and Podgrad (1989).

Among all the pure-breeds, the Swedish Landrace still predominates on farms. Large White, German Landrace, Pietrain and Duroc are still kept in limited numbers for the purpose of planned cross-breeding. In the production of piglets, most large-scale state farms and smaller private pig farms have been using sows of line 12 and boars of German Landrace for more than two decades. Since 1982, boars of Duroc, Pietrain and line 54 have also been used in production of piglets. Pig production has been improved by boars of the German and Swedish Landrace. In 1988, the first three breeding centres for breeding pigs were established on private farms in the region of Pomurje. At the end of 2001, there were in Slovenia

41 breeding centres on private farms involving some 800 pure-bred sows.

In Slovenia pig meat is produced in three ways:

Farm production of pigs: we have eight large-scale pig farms with a total annual capacity of 335,000 fattening pigs (100 kg) and breeding pigs. This accounts for 34.8 % of the total pig inventory in Slovenia. This is highly intensive production of high-quality slaughter pigs. Three quarters of the fodder has to be purchased outside the farms. These farms also perform most of the selection and testing of pigs in Slovenia. The farms employ skilled professionals with very broad professional knowledge of pig production.

Market production of pigs on smaller family farms: In the last twenty years, market pig production has expanded onto family farms. New buildings have been constructed and many farms have initiated exclusive pig production. The nucleus-herd contains mostly sows of line 12. The intensity of production varies considerably and is strongly linked to the professional input of experts. For the raising of piglets and for the fattening of pigs, about 70 % and 40 % of the feed is produced on farms, respectively.

Production of pigs for domestic consumption: This subsistent or self-sufficient supply of private farms with pork is still wide spread in Slovenia. Professional work is limited to the renewal of boars for natural

mating. We have no access to technical data related to such production (fertility, growth, feed conversion, and meat-yield or meatiness of pigs). Little has been done in terms of prevention of inbreeding, systematic exchanging or replacing of breeds and of nutrition of animals. Pigs are fed with home-grown feed and edible organic leftovers. This kind of production accounts for one third of all pig meat in Slovenia; however, it is left to its own resources.

The geographic conditions of Slovenia, the patterns of settlement, and complex problems related to environmental protection do not permit further establishment of additional large farms. The committee for pig production adopted a decision in 1985 not to build any more large pig farms. In the future, most attention will be paid to the development of market production on family farms. Such production will be encouraged mostly on those farms that can guarantee, at home or on rented land, enough production of feed, and non-damaging and suitable utilization of manure and slurry. Subsistence production will also be assisted as an additional activity on farms. In addition, all edible offal from dairies, abattoirs, bakeries and other divisions of the food industry will have to be used in pig production to a greater extent than previously. The future forms of pig production will have to comply with many regulations that are going to determine both animal- and environment-friendly procedures.

Za to rejo ni nobenih strokovnih podatkov (plodnost, rast, izkoriščanje krme in mesnatost prašičev). Zelo malo je narejeno za preprečevanje parjenja v sorodu, načrtno menjavanje pasem in prehrano prašičev. Za prehrano prašičev uporabljajo krmo, pridelano na kmetiji, in užitne organske odpadke. Ta reja da tretjino prašičjega mesa letno, je pa praktično prepustičena sama sebi.

Geografske razmere in poseljenost Slovenije ter težko rešljiva vprašanja varstva okolja ne dovoljujejo nadaljnje gradnje velikih farm. Leta 1985 je bil na odboru za prašičerejo sprejet sklep, da v Sloveniji ne bomo več gradili velikih farm. V prihodnje bomo namenjali največ pozornosti razvoju tržne prireje prašičev na kmetijah. Pospeševali in razvijali jo bodo na tistih kmetijah, ki bodo imele dovolj lastnih oziroma najetih površin za pridelavo krme in neškodljivo ter pravilno uporabo gnoja oziroma gnojevke. Pospeševali ali bolje rečeno ohranjali bodo tudi domačo rejo prašičev in sicer kot dopolnilno dejavnost na kmetijah. Za prehrano prašičev bo treba bolj kot do zdaj uporabiti tudi vse užitne odpadke mlekarn, klavnic, pekarn in drugih obratov živilskopredelovalne industrije. Prihodnja prašičereja bo morala slediti številnim predpisom, ki bodo določali živalim in okolju prijazno rejo.



Perutnina

V perutninarnstvu po obsegu prevladuje reja kokoši. Pri obeh proizvodnih usmeritvah, tako pri prieji mesa kot pri prieji jedilnih jajc, prevladujejo križanci, katerih starše uvažajo večje perutninarske družbe. Tako so v zadnjih letih uvažali predvsem starše pitovnih piščancev ross, pa tudi cobb, pri nesnicah pa predvsem starše isa brown in manj hisex brown.

Večino pitovnih piščancev spitamo pri kooperantih večjih perutninarskih družb v hlevih s talno rejo na nastilu. V zadnjem obdobju se je začela v manjšem obsegu pojavljati reja piščancev v izpustih. Večina jedilnih jajc je pridobljena v intenzivnih sistemih reje kokoši nesnic, predvsem v baterijski reji (v klasičnih kletkah). Tudi v manjših rejah in na kmečkih dvoriščih prevladujejo kokoši isa brown.

Tudi pitanje pur, ki se je v Sloveniji začelo po letu 1992, je organizirano v glavnem pri kooperantih večje perutninarske družbe. V Slovenijo uvažamo purja valilna jajca, največ BUT big6.

Slovenska grahasta kokoš, slovenska srebrna kokoš, rodajland, bela plimutka – linija B, bela plimutka – linija P in slovenska sintetična linija so vključene v selekcijo komercialnih križancev prelux. Obstajajo tri nesnice: prelux – R (rjava), prelux – G (grahasta), prelux – Č (črna) in brojler prelux – bro. Perutnina prelux je primerna za manjše in sonaravne reje.

V manjših rejah se postopoma širi tudi avtohtona pasma štajerska kokoš (variacija: jerebičasta).

Ljubitelji perutnine redijo številne druge čiste pasme kokoši in pasme drugih vrst perutnine, vendar te pasme nimajo večjega gospodarskega pomena. Posamezni rejci, ki redijo le manjše število živali, imajo pomembno vlogo pri ohranjanju velike pasemske pestrosti.



Poultry

Breeding of hens is the predominant activity in poultry production. In both kinds of production, eggs and meat, cross-bred animals predominate. The parents are imported by larger poultry organizations.

In recent years, we have been importing mostly broiler parents Ross, and also Cobb, and in-layer hen parents Isa brown, and to a lesser extent, Hisex brown.

Most broilers are fattened by cooperators of larger poultry enterprises in a poultry house with litter floor. Recently, to a lesser extent, free range production can also be found. Most table eggs are obtained in intensive systems of layer production, mostly batteries (conventional cages). The Isa brown breed is also prevalent in small production units and family farms.

Fattening of turkeys in Slovenia began after 1992. It is organized mostly by cooperators of large poultry organizations. Turkey hatching eggs are imported, mostly BUT big6.

Slovenian Barred hen, Slovenian Silver hen, Rhode Island Red, White Plymouth Rock (line B), White Plymouth Rock (line P) and Slovenian Synthetic line WM have all been included in the selection of commercial cross-breeds Prelux. There are three layers: Prelux - R (brown), Prelux - G (barred), Prelux - C (black) and broiler Prelux -bro. Prelux poultry is better suited to more sustainable production on a less intensive scale.

Smaller production units are also gradually introducing the Partridge Styrian hen.

Many other pure breeds of chickens and breeds of other species of poultry are raised by fancy breeders. These breeds do not have much economic significance. However, individual breeders, even though they only keep smaller numbers of animals, do have a valuable role in the conservation of the large diversity of breeds.

Rabbits

1.3.2.6

Rabbits are bred chiefly for meat production. Most of the rabbit meat that can be found on the market is produced in large-scale private enterprises. Most commercial breeders buy hybrid parents Hyla in Italy.

Parents of Slovenian selective provenance SIKA are more rarely used. Most producers are involved both in fattening and reproduction. Production focused solely on fattening can be found on a very limited scale. Rearing of both rabbit-does and fattening rabbits is carried out in wire cages.

A significant share of rabbit meat, which, however, does not appear on the market, is derived from small family farms that keep fewer than ten does with offspring.

These farms supply their relatives and friends (grey market). These owners breed their own animals and exchange them with each other. Some owners also buy breeding stock of the Slovenian selection SIKA. They are involved both in fattening and reproduction. Raising is carried out mostly in wooden boxes.

Many pure rabbit breeds are raised by fancy breeders of exhibition animals. This production does not have much economic significance. Individual breeders who only keep small number of animals still have an important role in the conservation of the greater diversity of breeds.



Kunci

V kuncereji prevladuje reja kuncev za meso. Večino kunčjega mesa, ki ga lahko dobimo na trgu, priredimo na večjih farmah v lasti zasebnih rejcev in nekaj podjetij. Večina kupuje komercialne hibridne starše

hyla v Italiji, le manjši delež kupuje starše slovenske selekcije SIKA. Večina rejcev se ukvarja s pitanjem in reprodukcijo, le s pitanjem pa samo majhen delež rejcev. Samice in pitance redijo v mrežastih kletkah.

Velik del prireje kunčjega mesa, ki pa se ne pojavi na trgu, izvira iz majhnih kmečkih rej, kjer redijo manj kot 10 samic s potomstvom. Z mesom oskrbujejo sorodnike in znance (sivi trg). Plemenske živali si vzrejajo sami, jih menjavajo med seboj, nekateri pa kupijo tudi plemenske živali slovenske selekcije SIKA. Rejci se ukvarjajo s pitanjem in reprodukcijo. Kunce večinoma redijo v lesenih hlevčkih na nastilu.

Številne čiste pasme kuncev redijo ljubiteljski rejci razstavnih živali. Te reje pa nimajo večjega gospodarskega pomena, ampak igrajo pomembno vlogo pri ohranjanju velike pasemske pestrosti.



Čebele

Za čebele s Kranjskega so se že kmalu začeli zanimati tudi tuji strokovnjaki za sistematiko čebel. Tako je Pollmann leta 1879 izdal knjižico *Vrednost različnih čebeljih pasem in njihovih varietet*, določena po presoji uglednih čebelarjev (*Wert der verschiedenen Bienenrasen und deren Varietäten, bestimt durch Urtheile namhafter Bienenzüchter*). V njej med drugimi obravnava tudi kranjsko čebelo in jo prvič imenuje z znanstvenim imenom *Apis mellifica carnica*. Ugotavlja, da najlepše kranjice dobavlja baron Emil Rothschütz (1836–1909) iz Podsmreke pri Višnji Gori na Kranjskem. Rothschütz je bil prvi izvoznik kranjske čebele in kmalu so mu sledili mnogi drugi. Med njimi je bil prav gotovo največji in najprodornejši Mihael Ambrožič (1846–1904) iz Mojstrane, pozneje Jan Strgar (1881–1955) iz Bitenj pri Bohinju. Od leta 1858 do konca prve svetovne vojne je dokumentiran izvoz za najmanj 170 000 čebeljih rojev, po nekaterih ocenah pa je število preseglo vrednost 500 000.

Po prvi svetovni vojni je trgovina s čebelami skoraj izginila zaradi sprememb v tehnologiji čebelarjenja ob prehodu iz kranjičev v večje listovne panje.

Po drugi svetovni vojni je bilo več poskusov oživitve načrtne vzreje matic, predvsem po letu 1979. V letu 1984 je bila ustanovljena republiška služba za selekcijo kranjske čebele pri Kmetijskem inštitutu Slovenije, kar je precej pospešilo kakovost in obseg vzreje matic. Ministrstvo za kmetijstvo, gozdarstvo in prehrano je na podlagi tedanje zakonodaje materialno in finančno podpiralo projekt selekcije čebel. V večjem delu Slovenije nam je tako z ustreznimi strokovnimi ukrepi uspelo do danes obdržati avtohtono populacijo kranjske čebele. To nam navsezadnje dokazujejo tudi najnovejši izsledki genskih raziskav.

Honey bees

1.3.2.7

Honey bees from Kranjska (Carniola) early on attracted the interest of foreign experts of bee systematics. In 1879, Pollmann issued a small book entitled "*Wert der verschiedenen Bienenrasen und deren Varietäten, bestimt durch Urtheile namhafter Bienenzüchter*". In addition to other breeds, he also treats the topic of the Carniolan honey bee to which he refers as *Apis mellifica carnica*. This is the first scientific designation of the name. He concludes that the most beautiful Carniolan bees are supplied by Baron Emil Rothschütz (1836–1909) from Podsmreka by Visnja gora in Carniola. Rothschütz was the first exporter of this breed and was later followed by many others. Mihael Ambrozic (1846–1904) from Mojstrana was exceptionally active, and was followed by Jan Strgar (1881 – 1955) from Bitnje in Bohinj. In the period between 1858 and the end of First World War, the export of at least 170,000 swarms is documented, with some estimates claiming even 500,000 swarms.

After the First World War, trade in honey bees almost ceased because of the changes in technology of bee-keeping. The small traditional hives "kranjic" were supplemented by larger back managed hives with movable frames.

After the Second World War, many attempts systematically to revitalize breeding of bee queens can be observed, especially after 1979. In 1984, a state service for selection of the Carniolan honey bee was established at the Agricultural Institute of Slovenia. This improved the quality and extent of breeding of queens. MAFF has been financially assisting the project of selective breeding of bees on the foundations of legislation of that time. In most parts of Slovenia, aided by appropriate professional measures, we have succeeded in maintaining the autochthonous population of this breed, which has recently been confirmed by the results of genetic research.



1.3.3

Ways of utilization of AnGR

Cattle accounts for almost the entire milk production in Slovenia (small ruminants participate with less than 0.5 %). Poultry leads in meat production (39 %) followed by pigs (35 %), and cattle (25 %). The ratio between milk and beef production in cattle, between meat production and egg in poultry is 54:30 and 62:35 respectively.

Horses are the only animals used in work; however, this fact only marginally influences a decision to raise horses. Nevertheless, focused horse breeding or production exists for the requirements of sport and leisure activities.

The economic importance of wool, furs and skins is marginal. These products are not included in selection programs. Some fancy rabbit breeders, however, may decide on production on the grounds of the fur.

In utilization of natural resources, cattle production is dominant, followed by small ruminants and horses.

The significance of autochthonous breeds of all species, and also traditional products, is growing, especially in terms of the conservation of cultural and natural heritage.

1.3.4

Progress of AnGR (selection program by species)

1.3.4.1

Cattle

All breeds that are important in human nutrition are included in cattle breeding programs (Slovenian Brown, Simmental, Black and White, Charolais, Limousin, Cika) (Appendix B2) which permits genetic progress in the economically most important traits and characteristics. These breeding programs include identification and registration of animals, breeding goals, recording economically important production and secondary traits, and the assessment of body conformation. Selection in these breeding programs is based on the individually assessed BV of both production (economic) and body conformation traits.

Genetic improvement in cattle breeds can be importantly enhanced by conscientious identification and production traits recording by breeders (provided the breeders have a permit for such an activity), and by optimal decision making in the choice of semen of tested bulls in artificial insemination. The share of insemination in Slovenia is 90 %. Animal owners can also increase the genetic gain by improving conditions for animal husbandry (nutrition, management), which are essential for the utilization of genetic potential.

Načini uporabe ŽGV

Govedo prispeva skoraj vse mleko (delež mleka drobnice je < 0,5 %) v skupni bilanci prirejenega mleka v Sloveniji. V bilanci prirejenega mesa je najpomembnejša perutnina (39 %), sledijo prašiči s 35-odstotnim in govedo s 25-odstotnim deležem. Vrednostno razmerje med prirejo mleka in mesa pri govedu ter med prirejo mesa in jajc pri perutnini znaša 54 : 30 in 62 : 35 v korist mleka oz. mesa.

Za delo se uporablajo le konji, vendar je pomen dela pri odločitvi o reji konj majhen. Le na rejo konj pa je omejena namenska reja živali za rekreativne dejavnosti.

Gospodarski pomen volne, krvzna in kože je majhen, ti izdelki niso pri nobeni vrsti vključeni v selekcijske programe. Le ljubiteljski rejci nekaterih pasem kuncev se za rejo odločajo predvsem zaradi krvzna.

Pri izkoriščanju naravnih virov ima največji pomen reja goved, sledi reja drobnice in konj.

Z vidika ohranjanja kulturne in naravne dediščine narašča pri vseh vrstah živali predvsem pomen avtohtonih pasem in tradicionalnih proizvodov.

Razvoj ŽGV (selekcijski programi po vrstah)

Govedo

Vse pasme goved v Sloveniji, pomembne za prirejo hrane (slovenska rjava, lisasta, črno-bela, šarole, limuzin in cika), so vključene v rejske programe (priloga B2), ki omogočajo genetsko izboljševanje gospodarsko pomembnih lastnosti. Vsi ti rejski programi vključujejo individualno označevanje živali, imajo napisan rejski cilj, vključujejo kontrolo gospodarsko pomembnih proizvodnih in sekundarnih lastnosti in ocenjevanje zunanjosti goved. Odbira živali pri teh rejskih programih temelji na individualno ocenjenih plemenskih vrednostih proizvodnih lastnosti in lastnosti zunanjosti, ki jih plemenske živali prenašajo na potomstvo.

H genetskemu izboljševanju pasem goved lahko rejci pomembno pripomorejo z vestnim označevanjem živali in kontrolo proizvodnih lastnosti (le v primerih, ko imajo za kontrolo dovoljenje) ter z optimalnimi odločitvami pri izbiri semena testiranih bikov za osemenjevanje. V Sloveniji je delež osemenjevanja pri govedu nad 90 %. Rejci v veliki meri pripomorejo k večjemu genetskemu napredku tudi z izboljševanjem možnosti za rejo, kar je prvi pogoj za izkoriščanje genetskega potenciala (prehrana, menedžment).

Pri razvoju ŽGV ima v slovenski govedoreji pomembno vlogo država. Večino dejavnosti, ki omogočajo genetski napredok populacij, sofinancira država (informacijski sistem, kontrola proizvodnih lastnosti, vrednotenje rezultatov kontrole vključno z izračunavanjem PV, prenos rezultatov selekcije v prakso, financiranje nakupa semena elitnih bikov za načrtno osemenjevanje, zagotavljanje zdravstvenega varstva živali - predvsem na področju kužnih bolezni...). Rejci, vključeni v shemo kontrole proizvodnih lastnosti, so preko območnih seleksijskih služb dolžni sodelovati v seleksijskem programu (prodaja bikcev iz načrtnega osemenjevanja na testno postajo v skladu s programom, osemenitve z mladimi, netestiranimi biki - omogočanje testa mladih bikov ...).

Rezultate programa genetskega izboljševanja populacij goved lahko uporabljo vsi rejci pod enakimi pogoji ne glede na velikost in ne glede na to, ali sodelujejo v sistemu kontrole proizvodnih lastnosti ali ne (pri-spevec države).

Sheme kontrole proizvodnih lastnosti se med pasmami nekoliko razlikujejo. Po kategorijah goved spremljamo te lastnosti:

TELETA

- označevanje in registracija telet (datum rojstva, poreklo, reja),
- ocena telesnih oblik in ugotavljanje morebitne prisotnosti dednih napak (biološki test),
- telesna masa ob rojstvu, pri 90. in 210. dneh starosti (samo pasmi šarole in limuzin).

KRAVE

- MLEČNOST: količina mleka, sestava mleka (mlečna maščoba, beljakovine, laktosa), število somatskih celic, sečnina, molznost (mlečne in kombinirane pasme),
- PLODNOST: potek telitve, datum osemenitve, datum telitve, doba med telitvama (vse pasme),
- TELESNE LASTNOSTI: 26 ocen in meritev zunanjosti živali; izbor lastnosti je usklajen z mednarodnimi pasmskimi združenji (linearno ocenjevanje) (slovenska rjava, lisasta, črno-bela, šarole in limuzin pasma).

BIKI

- RAST IN TELESNE LASTNOSTI: referenčna lastnost je dnevni prirast od 165. do 365. dne starosti in ocena zunanjosti (linearno ocenjevanje). Te lastnosti se kontrolirajo v direktnem testu (vse pasme - slovenska rjava, lisasta, črno-bela, šarole, limuzin in cikasta). V test so vključeni bikci iz načrtnega osemenjevanja - potomci bikovskih mater in elitnih bikov.

The Government plays an important role in the progress of AnGR. Most activities related to genetic gain in the population have been financed by the Government (information systems, recording of production traits, recording data evaluation including prediction of BV, implementation of selection results in practice, financing of acquisition of semen of elite sires for designed insemination, providing basic health care for animals (esp. with infectious diseases). Breeders that participate in the scheme of recording production traits are obliged to participate in a selection program via the regional selection services (selling of bulls from designed insemination to performance test stations in accordance with the program, insemination with young bulls - allowing the testing of young bulls, etc.).

The results of the program of genetic improvement of the cattle population can be used by all breeders under equal conditions, without regard to the production scale of each individual breeder, and irrespective of their participation in the recording system of production traits (this is a contribution of the Government).

The recording scheme of production traits differs to some extent among breeds. The following traits are recorded, according to the particular cattle category:

CALVES

- identification and registration of calves (birth date, provenance, herd, breeder),
- assessment of body conformation and determination of potential hereditary defects (biological test),
- weight at birth, at 90 and 210 days of age (only Charolais, Limousin).

COWS

- MILK YIELD: Milk yield, milk composition (fat, proteins, lactose content), somatic cell count, urea, milkability (dairy and dual-purpose breeds),
- FERTILITY: course of calving, insemination date, calving date, calving interval (all breeds),
- BODY CONFORMATION: 26 estimates and measurements of external animal traits; selection of properties has been harmonized with the international breeders' associations (linear assessment) (Slovenian Brown, Simmental, Black and White, Charolais, Limousin).

BULLS

- GROWTH AND BODY CONFORMATION: The daily weight gain (between 165 and 365 days of age) is a reference trait and a conformation trait (linear assessment). These properties are controlled in performance testing (all breeds - Slovenian Brown, Simmental, Black and White, Charolais, Limousin, and Cika). Bulls from designed insemination are involved (progeny of bull dams and elite sires).

•**FATTENING AND CARCASS TRAITS:** Traits of growth until slaughter takes place. Carcass traits collected on the slaughter line, traits of meat quality based on dissection of carcasses. Young bulls with a limited number of semen doses are involved in insemination. Testing is conducted on 12 to 15 offspring of young bulls (Slovenian Brown, Simmental, Charolais, Limousin).

Recording is directed by the Government. It is organized via regional centres, which are also financed by the Government. Breeders partially contribute to the realization of recording. In the future, these activities will probably be taken over by breeders' organizations.

To predict the BV of recorded properties, we use the method of mixed models and the repeatable animal model. With milk-yield-trait, the model includes data on the first five finished lactations. In the pedigree structure, we also take into account parents and grandparents, except for the maternal grandmother of the particular animal involved in the measurement. Statistical models for prediction of the BV of individual properties are tested continuously at the Interbull Center (Uppsala, Sweden) where publishing activities are also carried out.

In Slovenia, we present absolute BV calculated on the genetic basis, which currently (2002) consists of animals born in 1995. In addition to absolute values, we also present BV standardized in a manner whereby the average BV is put at 100, and where one standard deviation contains 12 units.

Improvement of genetic values of populations in cattle is mostly conducted via the application of semen of positively tested breeding bulls. The known estimates of BV in female animals enable population expansion of breeding animals and exclusion of animals with unsatisfactory BV.

Purebred selection is carried out in Slovenian Brown, Simmental, and Black and White breeds. Charolais, and Limousin are used in systematic cross-breeding. In female animals we record production in the pure line. Bulls included in artificial insemination are also tested via crossbreds between Slovenian Brown and Black and White, and Charolais and Limousin breeds.

•**PITOVNE IN KLAVNE LASTNOSTI:** lastnosti rasti do klavne zrelosti, lastnosti klavne kakovosti, zbrane na liniji klanja, lastnosti kakovosti mesa na podlagi disekcije klavnih polovic. V test so vključeni mladi biki, ki se z omej enim številom doz semena vključujejo v osemenjevanje. Test izvajamo na 12 do 15 potomcih mladih bikov (slovenska rjava, lisasta, šarole in limuzin pasma).

Za kontrolo skrbi država, organizirana pa je prek območnih centrov, ki jih prav tako financira država. K izvedbi kontrole deloma finančno prispevajo rejci. V prihodnje naj bi to delo postopoma prevzele rejske organizacije.

Za napovedovanje PV kontroliranih lastnosti uporabljamo metodo mešanih modelov in ponovljivostni model živali. Pri lastnostih mlečnosti zajema model živali podatke prvih petih laktacij. Pri strukturi pedigreeja upoštevamo tudi starše in stare starše, razen stare matere po materini liniji živali, ki je imela meritev. Statistične modele za napovedovanje PV posameznih lastnosti stalno testirajo v centru Interbull (Upsala, Švedska), kjer jih tudi objavljo.

V Sloveniji prikazujemo absolutne PV, preračunane na genetsko bazo, ki jo trenutno (l. 2002) sestavljajo živali, rojene v letu 1995. Poleg absolutnih prikazujemo tudi standardizirane PV na način, pri katerem je povprečna PV postavljena na 100, ena standardna deviacija pa ima 12 enot.

Genetska vrednost populacij se pri govedu izboljšuje predvsem z uporabo semena pozitivno testiranih plemenskih bikov. Znane ocene PV pri ženskih živalih omogočajo širitev plemenskih živali v populaciji in izločanje živali z nezadovoljivimi PV.

Čistopasemska selekcijo izvajamo pri slovenski rjavi, lisasti in črno-beli pasmi. Za sistematično križanje uporabljamo predvsem pasmi šarole in limuzin. Pri ženskih živalih kontroliramo proizvodnjo v čisti pasmi. Bike, ki jih vključujemo v umetno osemenjevanje, pa testiramo tudi na križancih slovenske rjave in črno-bele pasme z omenjenima mesnima pasmama.



Ovce in koze

V nacionalni program kontrole in selekcije v Republiki Sloveniji so vključene naslednje pasme ovc: jezersko-solčavska, z romanovsko oplemenjenja jezersko-solčavska ovca, texel, belokranjska pramenka, namenjene pa so prieji jagnjet (mesna usmeritev).

Bovška ovca, istrska pramenka, z vzhodnofrizijsko oplemenjenja bovška ovca so namenjene prieji mleka in jagnjet (mlečna usmeritev). Pasmo texel uporabljamo za gospodarsko križanje pri pasmah jezersko-solčavska, z romanovsko oplemenjenja jezersko-solčavska in oplemenjena bovška ovca, v čistih rejah je le nekaj tropov za vzrejo ovnov.

Slovenska sanska in slovenska srnasta pasma koz sta namenjeni prieji mleka, drežniška koza pa je kombinirana. Za priejo kozličev in gospodarsko križanje imamo v programu selekcije in kontrole bursko pasmo koz.

Pri vseh omenjenih pasmah ovc in koz poteka strokovno delo in so vključene v nacionalni program selekcije in kontrole, v katerega je zajetih okoli 20 % vseh živali. Ob tem izvajamo tudi testiranje ovnov na dveh krajin in s temi ovni zadovoljimo okoli 50 % potreb po plemenjakih v Republiki Sloveniji, 50 % pa jih vzredijo v kontroliranih tropih (plemenskih čred).

Strokovne službe in rejske organizacije imajo za posamezne pasme napisane in potrjene rejske programe. Ti pri vsaki pasmi določajo rejske cilje za posamezne lastnosti. V selekcijo vključene živali so individualno označene, pri njih pa opravljamo kontrolno proizvodnih lastnosti in oceno lastnosti zunanjosti. Odbira živali temelji na individualno fenotipsko izmerjenih ali ocenjenih lastnostih in individualni oceni PV za prirast ter oceni mesnatosti (moške živali). Pri mlečnih pasmah napovedujemo plemenske vrednosti za lastnosti mlečnosti z metodo BLUP.



Sheep and goats

1.3.4.2

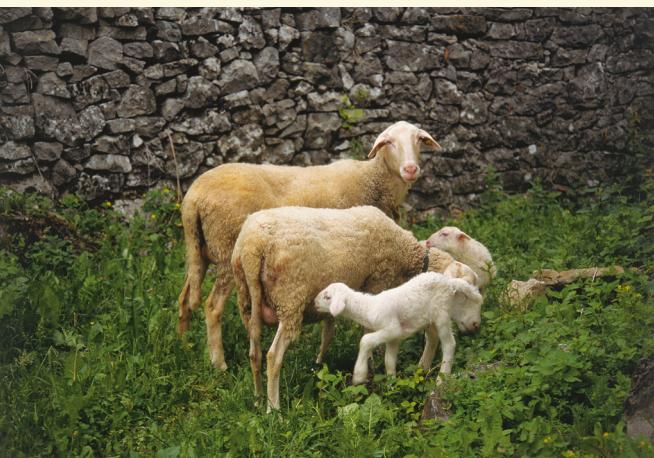
In Slovenia, the following breeds are involved in the national recording and selection program: Jezersko-Solcava, improved Jezersko-Solcava, Texel, Bela Krajina Pramenka and are intended for the production of lambs (meat).

Bovec sheep, Istrian Pramenka, Bovec sheep improved with East Friesian breed are used for the production of both milk and lambs. Texel is used in industrial crossbreeding of Jezersko-Solcava sheep, improved Jezersko-Solcava sheep, and improved Bovec sheep. There are only a few flocks of pure bred Texel that are used for breeding of rams.

The Slovenian Saanen goat and Slovenian Alpine goat are intended for milk production. The Dreznica goat is a dual-purpose breed. The Boer goat is included in the recording and selection program for the purposes of producing of kids and of industrial crossbreeding.

All of the above sheep and goat breeds are under professional surveillance. Some 20 % of all animals are included in the national recording and selection program. The male animals are tested at two locations. These rams meet demands for 50 % of the breeding needs in Slovenia, and 50 % of the rams are raised in flocks under controlled conditions (breeding flocks).

Professional services and breeders' organizations provide an approved breeding program for individual breeds. It contains breeding aims for individual traits in each of the respective breeds. Animals included in selection are marked individually. Recording of production traits and assessment of external traits is performed on these animals. Selection is based on traits that are measured phenotypically and individually, or on estimated traits, and on individual assessment of BV for weight gain and for the estimation of meatiness (male animals). In milk breeds, the BLUP method is used to predict BV for milk-yield properties.



1.3.4.3

Horses

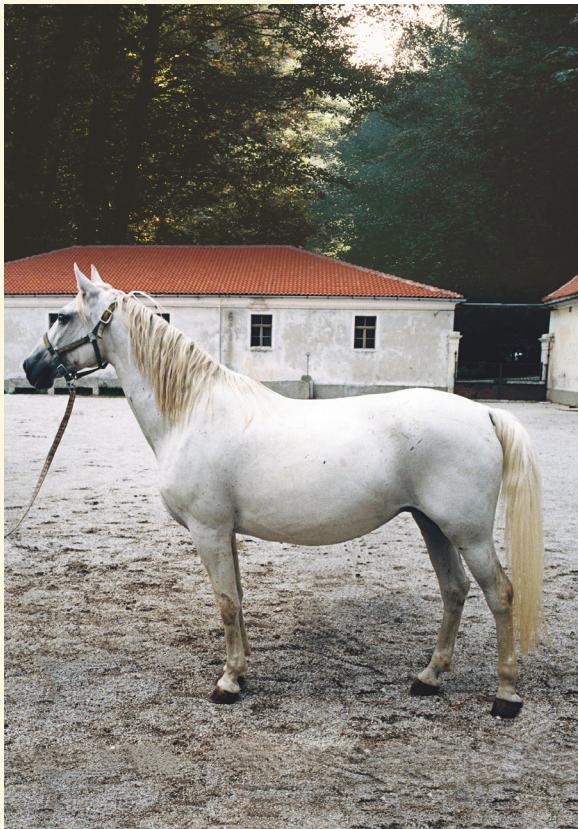
The Republican Stud Book Authority at the Veterinary Faculty performs technical and professional work in relation to the selection of horses. It is aided by horse-breeding centres and stud farms such as Lipica, Horse-Breeding Centre Krumperk, and Horse-Breeding Centre Prestranek and by representatives of the association of breeders of individual breeds.

Eleven horse breeds are involved in breeding activities in Slovenia: Lipizzan horse, Posavje horse, Slovenian cold-blooded horse, Ljutomer Trotter, Haflinger horse, Thoroughbred, Slovenian warm-blooded horse, Noric, Quarter, and Icelandic horse. All these animals are marked individually and registered in the herd books of the above Service or stud farms.

Provenance is also verified by molecular genetic methods. In all breeds, except for the Thoroughbred horse, all external traits are continuously assessed. We currently assess working capacity in the Lipizzan horse, Trotter, Haflinger, Hannoverian, Thoroughbred, and the Slovenian warm-blooded horse. Sports results of riding horses which serve as a basis for assessment of the working capacity and selection are monitored by the Equestrian Federation of Slovenia, and for trotters by the Trotter Federation of Slovenia.

Selection of animals is based on phenotypically measured external traits and an examination of working capacity (test, sports results).

To improve the genetic traits of horse breeds included in selection more rapidly, we plan in the future to introduce modern methods of reproduction by artificial insemination (AI) and to apply the most recent software and methods of calculation, such as will be adopted by ICAR resp. INTERSTALION.



Konji

V Sloveniji opravlja tehnično in strokovno delo pri selekciji konj Republiška služba za konjerejo pri Veterinarski fakulteti ob pomoči konjerejskih centrov in kobilarn, kot so: Kobilarna Lipica, Konjerejski center Krumperk, Konjerejski center Prestranek, in predstavnikov združenja rejcev posameznih pasem.

V Sloveniji je v načrtno rejsko delo vključenih 11 pasem konj: slovenski hladnokrvni konj, posavski konj, noriški konj, haflinger, lipicanski konj, slovenski toplokrvni konj, polnokrvni anglež, arabec, ljutomerski kasač, konj pasme quarter in islandski konj. Živali vseh teh pasem so individualno označene in registrirane v rodovniških knjigah službe ali kobilarn.

Poreklo preverjamo tudi z molekularnogenetskimi metodami. Pri vseh pasmah razen pri angleškem polnokrvnem konju stalno ocenujemo lastnosti zunanjosti živali. Trenutno ocenujemo delovno sposobnost konj pri lipicanskem, kasaškem, haflinskem, hanoverskem in polnokrvnem angleškem in slovenskem toplokrvnem konju. Športne dosežke, ki se uporabljajo tudi za oceno delovnih sposobnosti, in selekcijo vodi za jahalne konje Konjeniška zveza Slovenije, za kasače pa Kasaška zveza Slovenije.

Odbira (selekcija) živali temelji na fenotipsko izmerjenih lastnostih zunanjosti in na podlagi preizkusa delovne sposobnosti (test, športni dosežki) pri pasmah, kjer se ta preizkus ali športno tekmovanje opravlja.

Za hitrejše izboljšanje genetskih lastnosti pasem konj, vključenih v seleksijsko delo, v prihodnje načrtujemo uvajanje sodobnih metod razmnoževanja (osemenjevanje) in uporabo najnovnejših orodij ter metod izračuna, kot ga bo sprejel ICAR oziroma INTERSTALION.



Prašiči

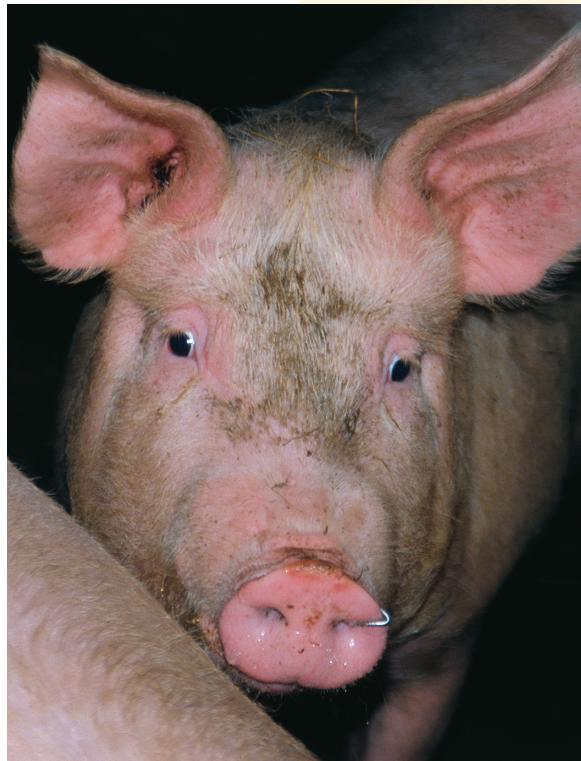
V Sloveniji je nukleus, pri katerem izvajamo vzrejo čisto-pasemskega prašičev, na štirih selekcijskih farmah. Med temi farmami v zadnjih letih ni prometa s plemenskim materialom. Tako so nukleusi zaprti, kar zmanjšuje velikost populacije.

Za vzrejo plemenskih križank linije 12, v manjšem obsegu tudi linije 21, uporabljamo pasme švedska landras in large white, kot terminalne pasme za proizvodnjo komercialnih pitancev pa uporabljamo pasme duroc, pietrain, nemška landras in križanke linije 54, preizkušamo pa še large white 66 in linijo 34. Redimo pa tudi manjšo populacijo avtohtone pasme prašičev - krškopoljski prašič.

Selekcijski cilji so postavljeni v skladu s tro - oziroma štiripašemsko selekcijsko piramido. Pri selekciji je največji poudarek na pitovnih in klavnih lastnostih, pomembne pa so tudi lastnosti plodnosti, odpornosti proti stresu ter lastnosti zunanjosti.

Za napoved PV lahko uporabimo podatke, ki so zbrani prav v ta namen na testnih postajah, klavnicah ali laboratorijih, ali v pogojih reje. Prve podatke dobimo iz bolj kontroliranih pogojev, ki so naravnani tako, da bi genetske sposobnosti prišle bolj do izraza. Pogosto se ti pogoji zelo razlikujejo od pogojev v proizvodnih razmerah. Ker pri tem obstaja možnost interakcije med genotipom in okoljem, selekcija ne sme temeljiti izključno na teh podatkih. Test v proizvodnih razmerah se uporablja za merjenje interakcije, uporabimo ga lahko tudi kot vir nekoliko manj zanesljivih informacij. Ker pa je merjenih živali v proizvodnih razmerah praviloma več kot meritev na testnih postajah, je lahko pomen teh lastnosti pri selekciji razmeroma velik, lahko celo prevladujoč. Pomemben je zlasti pri lastnostih plodnosti, ki jih lahko merimo le v proizvodnih razmerah, preizkusu mladic in pri mesnatosti, merjeni na liniji klanja.

Merjasce odbiramo v več stopnjah. Kot prvo odbiro bi lahko šteli že izbiro staršev, kot drugo pa določanje gnez, v katerih ne bomo opravili kastracije. V obeh fazah že lahko upoštevamo PV, proizvodnost staršev in morebiten pojav dednih napak pri sorodnikih. Pri izbiri staršev smo pozorni na to, da testiramo potomce vseh merjascev v nukleusu. Izbiramo praviloma mlajše starše (mladice, prvesnice, merjasce po končanem testu), da skrajšamo generacijski interval. Pujiske (lahko izberemo samo zaželen spol) v gnezdih, ki so namenjeni testiranju, označimo



Pigs

1.3.4.

Nucleus herds involved in pure-breeding are kept on four selection farms. There has been no exchange in breeding material between nucleus herds in recent years. The nucleus herds are therefore closed, which decreases the effective population size.

Maternal breeds are Swedish Landrace and Large White, reared mainly to produce F1 gilts, so called line 12, and, to lesser extent, line 21. Duroc, Pietrain, German Landrace are used as terminal breeds in production of commercial fatteners, which are often replaced by crossbred line 54 cross-breeds. Large White 66 and line 34 have also been included in the test. We also breed a smaller population of the Krško Polje autochthonous breed.

Selection objectives have been set in accordance with the three- and four-breed selection pyramid. The highest weight is given to fattening and carcass traits. Stress resistance, fertility and external traits are also considered.

To predict BV, data can be collected solely for this purpose at test stations, abattoirs, laboratories or under production conditions, in a so called field test. The first data are obtained from controlled conditions in order to amplify genetic capacities. These conditions frequently differ from conditions of commercial production. The data from test stations cannot be the only source of information because of possible interactions between genotype and environment. Comparison of field test and test station data evaluate the size of interaction. It can also be used as a source of some less reliable information. Furthermore, field test data can also be used as a rich source of information, but which is less reliable than in the case of the field test of gilts and commercial carcass grading on the slaughter line. Because the amount of field data can grow enormously, they can strongly influence the predicted BV, in some cases they even prevail in the data collected at test stations. However, the field test is the only source of data for fertility and survival traits, because these can only be collected in production.

Boars are selected in several stages. Parental selection could be considered to be the first phase of selection. The second is the selection of litters not to be castrated. In both phases, the breeding value, parental production traits, and incidence of hereditary defects in relatives may already be considered. Progeny are chosen to insure that all nucleus

sires are tested. With regard to parents we pay attention to the testing of progeny of all boars in the nucleus. We normally select younger parents (gilts, primiparous sows, boars after the test) in order to shorten the generation interval. Piglets to be tested (we can select the preferred gender) are individually tattooed with an ear number, which is uniform within Slovenia.

Performance testing of boars starts at 30 kg, followed by selection at 60 and 100 kg. In the testing period, growth and feed intake is recorded at both intervals. Additionally, backfat thickness is taken at the end of test. Aggregate genotype of boars combines BV for the duration of fattening and feed efficiency from 30 to 100 kg. As well as backfat assessed by the mixed model methodology. Boars should not have hereditary defects or external deficiencies. We also avoid stress sensitive animals, assessed by gene test. At 100 kg, boars are arranged into four categories according to aggregate genotype: nucleus, nucleus - still on testing, artificial insemination, natural mating, slaughter, and slaughter - exterior. The predicted aggregate genotype of sires is viewed once per month.

Gilts are assessed at between 90 and 100 kg (limits of 80 to 120 kg). They are identified and weighed. Backfat is measured in the same way as in boars. Data describing pedigree, origin and birth are initially checked. Gilts have to be marked clearly and need to have a known ancestry. Phenotypic selection is performed at weighing on the basis of phenotypic values for daily weight gain from birth to selection, backfat thickness and exterior. Exterior traits contain breed specific characteristics, leg score, and especially functional traits such as the number of normally developed and placed teats, occurrence of blind teats, etc. Swedish Landrace, Large White, and cross-bred gilts need to have at least 12 normal teats. In other breeds, the criteria are adjusted appropriately. Culling rate of gilts is accounted to supply and demand, while planning peaks in production must be avoided - in other words, we must avoid large replacement, in order to smooth selection intensity over time. Breeding value in gilts is assessed by the mixed model methodology. Gilts are ranked according to predicted aggregate genotype; however, the final decision is left to breeders.

The modern Slovenian selection program for pigs is supported by an information system. The system contains modules for monitoring the breeding stock, production traits for management and selection purpose. The data are stored in a common relational database and are used for all purposes. In order to monitor selection efficiency, phenotypic changes are controlled regularly for production traits. Certain other analyses, such as evaluation of crossbreeding schemes or effectiveness of imported genetic material, are performed occasionally.

individualno z ušesno številko, ki je v Republiki Sloveniji enolična.

Lastni test merjascev se začne z odbiro ob naselitvi, nadaljuje z odbiro pri 60 in 100 kg. Med preizkušnjo spremljamo rast in porabo krme v posameznih intervalih ter merimo debelino hrbtne slanine pri 100 kg. Aggregatni genotip za merjasce združuje plemensko vrednost za rast, izkoriščanje krme in mesnatost. Odbrani merjasci bodo rastni in mesnati ter bodo dobro izkoriščali krmo. Merjasci morajo biti brez dednih napak in napak zunanjosti, pri odbiri pa se izogibamo živalim, občutljivim za stres (genski test). Pri končni odbiri so merjasci na podlagi ranga in pregleda zunanjosti razvrščeni v štiri kategorije odbire: dom, dom - ohranitev linije, pleme - osemenjevanje, pleme - naravni pripust in klanje ter klanje - zunanjost. Pri plemenskih merjascih se najmanj enkrat na mesec preveri napoved agregatnega genotipa.

Meritve pri mladicah opravljamo predvidoma pri masi od 90 do 100 kg (meje od 80 do 120 kg). Živali identificiramo, stehtamo in izmerimo debelino hrbtne slanine z UZV. Iz dokumentacije si predhodno poiščemo podatke o poreklu in rojstvu. Odbrane mladice morajo biti jasno označene in imeti znano poreklo. Fenotipsko odbiro opravimo že ob tehtanju na podlagi fenotipskih (izmerjenih) vrednosti za dnevni prirast od rojstva do odbire, debeline hrbtne slanine in ocene zunanjosti. Poleg pasemskih značilnosti in stanja nog smo posebej pozorni na funkcionalne lastnosti (npr. število normalno razvitih in razporejenih seskov, pojav slepih seskov in drugih napak). Mladice pasem švedska landras, large white in križanke linije 12 morajo imeti vsaj 12 normalno razvitih in razporejenih seskov. Pri drugih pasmah se merilo smiselno prilagodi. Napake v zunanjosti, zaradi katerih mladice izločimo, šifriramo po dogovorjenem šifrantu. Delež izločenih mladic praviloma prilagodimo ponudbi in povpraševanju oziroma potrebam. Pri načrtovanju proizvodnje se moramo izogibati koničam - enkratnim obsežnim obnovam, da je intenzivnost selekcije enakomernejša. Pri mladicah ovrednotimo PV po metodi mešanega modela in ovrednotimo aggregatni genotip. Določimo rang, dokončna odbira pa je prepuščena rejcem.

Sodobni slovenski selekcijski program za prašiče je podprt z informacijskim sistemom. V sistemu so razviti moduli za spremljanje staleža plemenskih živali, spremeljanje in uravnavanje plodnosti, vodenje selekcije, uravnavanje reje in spremeljanje mesnatosti. Podatki so shranjeni v enotni zbirkki podatkov in se uporabljajo za različne namene. V selekcijske namene redno spremljamo fenotipske spremembe za lastnosti v preizkusih in proizvodnih razmerah. Prav tako enkrat letno opravimo analizo ocene generacijskega intervala, realizirane intenzivnosti selekcije in sestave populacij ter analizo genetskih in okoljskih sprememb. Občasno preverimo uspešnost drugih ukrepov, kot npr. preveritev križanja, učinkovitost vnosa genskega materiala iz tujih populacij.

Perutnina

Vseh sedem pasem kokoši je vključenih v načrtno rejsko delo v Sloveniji. Odbira živali temelji na izpolnjevanju rejskih ciljev. Individualno so označene živali tistih jat in pasem, ki so vključene v kontrolo proizvodnih lastnosti in odbiro. To so živali pasem: štajerska kokoš (variacija: jerebičasta), slovenska grahasta, slovenska srebrna in rodajland. Pri drugih pasmah (bela plimutka – B, P in slovenska sintetična linija WM) ne označujemo posameznih živali, temveč le jate.

Pri štajerski kokoši (variacija: jerebičasta), slovenski grahasti, slovenski srebrni in rodajland pasmi spremljamo pri jatah, ki so vključene v kontrolo, nesnost, lastnosti jajc (masa jajc, kakovost jajčne lupine, prisotnost krvnih in mesnih peg, barva rumenjaka), starost ob spolni dozorelosti in telesno maso. Pri teh pasmah kokoši zaradi hitrejšega izboljševanja lastnosti občasno uporabljamo tudi umetno osemenjevanje.

Živali odbiramo v več fazah. Postopke odbire začnemo že pri dan starih piščancih, pozneje pa jih odbiramo še med 6. in 8. ter 16. in 18. tednom (predodbira). Pri dokončni odbiri živali za oblikovanje novih generacij upoštevamo fenotipsko ocenjene in izmerjene lastnosti jat ter izračunane PV posameznih živali. PV ocenjujemo z indeksom, ki vključuje povprečno tedensko število jajc po kokoši med testom in povprečno maso treh zaporedno znesenih jajc po kokoši. Kot dodatno merilo pa so v izračun indeksa vključene tudi starost in masa kokoši ob znesenem prvem jajcu ter kakovost jajčne lupine.

Pri drugih treh pasmah (bela plimutka – B, P in slovenska sintetična linija WM) pa kontroliramo le maso jarkic in petelinčkov (spremljanje poteka rasti oz. dozorevanja). Selekcijski pri teh pasmah oz. linijah temelji na fenotipsko izmerjenih in ocenjenih lastnostih skupine živali (jate).

Pri perutnini torej selecioniramo v čisti pasmi oziroma liniji, to pa je podlaga za sistematično oblikovanje križančev za prirejo jajc in perutninskega mesa.



Poultry

1.3.4.5

All seven breeds are involved in planned breeding activities in Slovenia. Selection is based on the fulfilment of breeding goals. Those animals of flocks and breeds that are involved in the control of production traits are marked individually. These are the following breeds: Partridge Styrian hen, Slovenian Barred hen, Slovenian Silver hen and Rhode Island Red. In other breeds (White Plymouth Rock (lines: B and P), Slovenian Synthetic line WM) we only mark flocks and not individual animals.

In the control of Partridge Styrian hen, Slovenian Barred hen, Slovenian Silver hen and Rhode Island Red, we monitor egg production, egg traits (weight, shell quality, blood and meat spots, yolk, and colour), age at sexual maturity, and body weight. In order to accomplish a more rapid improvement of traits we sometimes employ artificial insemination.

Selection is conducted in several phases. Selection procedures are begun in day-old chicks, followed at weeks 6, 8, 16, and 18. In the final selection for the formation of new generations, we consider phenotypically assessed and measured traits of flocks, as well as the calculated BV of individual animals. BV is assessed by an index, which comprises the average weekly number of eggs of a single hen at the moment of test and the average weight of three eggs laid by the hen in succession. As an additional criterion, the index calculation also includes the age and weight of the hen when the first egg is laid, and also the quality of the shell.

In three other breeds (White Plymouth Rock (lines: B and P), Slovenian Synthetic line WM) we only control the weight of pullets and cockerels (monitoring the growth and maturing process). Selection in these breeds or lines is based on phenotypically measured and estimated traits of a group of animals (flock).

In poultry, we thus perform selection in pure breeds or lines that are the basis for the systematic formation of cross-bred animals, both for egg production and the production of meat.



1.3.4.6

Rabbits

In Slovenia, the maternal (A) and paternal (C) lines of domestic selection are included in the program of genetic improvement of populations. This selection is called SIKA. The White New-Zealand rabbit was the basis for both lines. These two lines now differ genetically. They also differ in production traits. The goal of selection on both A and C lines is the supply of better parents for commercial breeding of cross-bred animals for meat production. Animals of both lines are marked individually. The breeding goal in both lines is outlined clearly and is written down in the breeding program.



The recording of production traits of maternal line A contains the following properties: number of litters per doe per year, littering interval, number of live-born and still-born young animals per warren, weight-gain in litter, litter weaning weight, weight at 65 days of age, and mortality before weaning. Breeding values are calculated for daily litter weight gain, number of live-born animals in the litter and mortality before weaning. From the preceding three BV, we compose a selection index which serves as a basis for further selection.

In the paternal line C, we monitor growth traits, carcass quality traits, and also fertility traits, which are the same as in line A. We monitor growth by weighing at weaning, and at 65 days of age. The goal of C line selection is to improve growth capacity and capacity for meat production, so we monitor growth until 90 days of age. Similar to line A, we also create a selection index in line C. This serves as a basis for selection of both female and male animals.

In the future, we wish to select a paternal line that will enable fattening of cross-bred animals to a higher body weight. We also wish to improve feed conversion efficiency and carcass traits.

Kunci

V program genetskega izboljševanja populacij sta v Sloveniji vključeni materina (A) in očetovska (C) linija slovenske selekcije kuncev, ki jo imenujemo SIKA. Podlaga obej linij je bil beli novozelandski kunc;

liniji sta danes genetsko različni, prav tako se razlikujeta tudi po proizvodnih lastnostih. Cilj selekcioniranja linij A in C je zagotavljanje boljših staršev za komercialno revo križancev za prievo meso. Živali obej linij so individualno označene, obe liniji imata jasno določen rejski cilj, ki je zapisan v rejskem programu.

V kontrolo proizvodnih lastnosti so pri materini liniji A zajete te lastnosti: število gnezd na samico letno, doba med kotitvama, število živo-in mrtvorojenih mladičev v gnezdu, prirast gnezda, telesna masa ob odstavitev in na 65. dan starosti ter pogin do odstavitev. Plemenske vrednosti izračunamo za dnevni prirast gnezda, za število živorojenih mladičev v gnezdu in za pogin do odstavitev. Iz navedenih treh PV oblikujemo seleksijski indeks, na podlagi katerega odbiramo živali.

Pri očetovski liniji C spremljamo lastnosti rasti in lastnosti klavne kakovosti ter lastnosti plodnosti, ki so enake kot pri liniji A. Rast spremljamo s pomočjo tehtanj ob odstavitev in na 65. dan starosti. Ker je cilj selekcije linije C povečanje zmogljivosti rasti in zmogljivosti za prievo meso, spremljamo rast do 90. dne starosti. Podobno kot pri liniji A oblikujemo tudi pri liniji C seleksijski indeks, na podlagi katerega odbiramo samice in samce.

V prihodnje želimo selekcionirati očetovsko linijo, ki bo omogočala pitanje križancev na večjo telesno maso. Prav tako želimo izboljšati izkoriščanje krme in klavne lastnosti.



Honey bees

Licensed bee-queen breeding centres are the basis for selection in the field of bee-keeping in Slovenia. The central bee breeding service conducts activities of breeding queens and it controls the breeding purity of the population. It offers all assistance to bee-keepers, and it also conducts laboratory analyses of morphologic traits of bees, and analyses of mtDNA. It also provides the uninterrupted utility of an information system.

Each honey bee queen breeding centre conducts primary selection of bee families on one location. It breeds the queens in another apiary. Each breeding centre selects the queens from their appropriate resources. Interchange of queens between centres is not allowed in order to prevent inbreeding.

Primary selection of bee families is based on the proper production of the best family with two-year old queens. In selection we consider also morphometrical properties and gentle behaviour. The families must not show signs of swarming. Each breeding centre selects at least three queens per year. At least 15 daughters are included in the indirect production test. This test is conducted by contractor bee-keepers. These bee-keepers perform an important service in selection of Carniolan honey bees since they collect all the selection parameters on a voluntary basis.

The production test of Carniolan honey bee queens, as established today, has been in operation since 1992. The average phenotypic increase in honey production amounts to 0.69 kg per year. Breeding value is assessed with a selection index.

Čebele

1.3.4.7

Podlaga seleksijskega dela v čebelarstvu v Sloveniji so pooblaščena vzrejališča čebeljih matic. Republiška seleksijska služba vodi dejavnosti vzrejališč čebeljih matic, nadzira pasemsko čistost populacije, čebelarjem vzrejevalcem matic zagotavlja vso potrebno tehnično svetovanje ter opravlja laboratorijske analize morfoloških lastnosti čebele in analize mtDNA. Skrbi tudi za nemoteno delo informacijskega sistema.

Vsako vzrejališče na enem kraju opravlja primarno odbiro čebeljih družin, v drugem čebelnjaku pa vzreja čebelje matice. Vsako vzrejališče odbira matice iz svojih lastnih virov. Izmenjava matic med vzrejališči zaradi preprečevanja parjenja v sorodu ni dovoljena.

Primarna odbira čebeljih družin temelji na lastni prireji najboljše družine z dvoletnimi maticami. Pri odabiru upoštevamo tudi pasemske lastnosti in mirnost, čebelje družine tudi ne smejo kazati znakov rojenja. Vsako vzrejališče odbere letno najmanj tri matice, po vsaki matici vključimo v posredni test proizvodnje najmanj 15 hčera. Ta test opravljajo pogodbeni čebelarji. Pogodbeni čebelarji opravljajo zelo pomembno delo pri selekciji kranjske čebele, saj vse za selekcijo potrebne parametre zbirajo brezplačno.

Test proizvodnje matic kranjske čebele, kot je zasnovan danes, poteka od leta 1992. Povprečno fenotipsko povečanje proizvodnje medu znaša v tem obdobju 0,69 kg na leto. Plemenska vrednost se ocenjuje s seleksijskim indeksom.



1.3.4.8

Fish

Fish selection and pedigree register activities in Slovenia are limited to the rainbow trout. The program of brood stock monitoring is also conducted in all species reproduced in fish farms and not naturally.

In view of the difficulties in the identification of fish the pedigree register remains limited to monitoring of relatives of individuals used in the assessment of BV (individual marking of animals at one year of age).

Selection is based on estimated BV. Breeding values are calculated on the basis of individual phenotypic value and mean value of collateral relatives. BV is assessed for body weight at 450 days of age. Selection on the basis of rapid growth is indirectly influenced by feed consumption efficiency. In selection for resistance we employ a selection method of independent culling. This means that groups of relatives with low resistance (high mortality prior to individual marking at one year of age) do not get included in the further selection process. In fish selection in Slovenia we thus conduct selection within the nucleus which, at the final assessment of BV, is also defined on the basis of pre-selection. Animals that are not selected in the nucleus (as the parents of succeeding generations) can produce fish-eggs and semen for production purposes in the next spawning season. This enables fish farmers to acquire breeding material (eggs, semen, fish larvae) with above-average BV.

BV assessed in such a way yields an average accuracy of assessment from 0.5 to 0.7. It would be sensible in the future also to assess the BV of those male animals that are widely used for semen, also on the basis of information collected from progeny (progeny test).

Ribe

V Sloveniji je delo pri selekciji in rodovništvu rib omejeno le na kalifornijsko postrv, program kontrole plemenskih ribjih jat pa izvajamo tudi pri vseh drugih vrstah, pri katerih razmnoževanje ne poteka naravno, temveč v ribogojnicah.

Glede na težavnost označevanja rib je rodovništvo omejeno le na spremljanje sorodstva osebkov, ki jih uporabljamo za ocenjevanje PV (individualno označevanje osebkov pri starosti enega leta).

Program selekcije temelji na individualno ocenjenih PV osebkov na podlagi lastne fenotipske vrednosti in srednje vrednosti kolateralnih sorodnikov. PV ocenjujemo za telesno maso pri 450 dneh starosti. Z odbiro na hitro rast posredno odbiramo tudi na izkoriščanje krme. Pri selekciji na odpornost pa uporabljamo seleksijsko metodo neodvisnih spodnjih mej. To pomeni, da skupin sorodnikov s slabo odpornostjo (velika smrtnost pred individualnim označevanjem pri enem letu starosti) ne vključujemo v nadaljnje seleksijsko delo. Pri selekciji rib v Sloveniji torej selekcioniramo znotraj nukleusa, ki ga ob končni oceni PV sestavimo tudi na podlagi predodbir. Zato je mogoče živali, ki niso odbrane za nukleus (kot starši naslednjih generacij), v naslednji drstni sezoni uporabiti tudi za pridobivanje iker in semena, kar zainteresiranim rejcem omogoča nakup plemenskega materiala (iker, sperme, mladic) z nadpovprečnimi PV.

Pri tako ocenjeni PV je pričakovana povprečna točnost ocene med 0,5 in 0,7. Zato bi bilo v prihodnje smiselno ocenjevati PV samcev, katerih seme široko uporabljamo, tudi na podlagi informacij, zbranih na potomstvu (progeni test).



Organiziranost rejskega dela

Sedanje stanje

Slovenska zakonodaja ureja večino strokovnih nalog s področja zootehniko. Zakonsko so urejeni vodenje rodovniških knjig, označevanje plemenskih živali, promet s plemenskimi živalmi, selekcija in rodovništvo, kontrola proizvodnje in reprodukcija, prav tako sta posebej urejeni čebelarstvo in ribogojstvo. Urejeni so osemenjevanje domačih živali in načini potrjevanja plemenjakov ter metode testiranja plemenskih živali, označevanje in identifikacija plemenskih živali ter vodenje predpisanih registrov in evidenc.

Vse navedene naloge izvajajo javni zavodi, kot so Univerza v Ljubljani, Biotehniška fakulteta, Oddelek za zootehniko, Veterinarska fakulteta v Ljubljani, Univerza v Mariboru, Fakulteta za kmetijstvo Maribor, Kmetijski inštitut Slovenije, območni kmetijsko-gozdarski zavodi, ter druge organizacije, kot so posamezna podjetja, zadruge, društva in posamezniki. Rejske organizacije dejavno sodelujejo pri določanju rejskih programov, letnih programih dela, člani rejskih organizacij vodijo komisije za odbiro plemenjakov, nosilci vseh nalog pa so še vedno strokovne ustanove oziroma zavodi. Večino strokovnega dela opravljamo na dveh horizontalnih ravneh, in sicer na republiški predvsem napoved plemenske vrednosti, obdelavo podatkov mlečne kontrole in drugih testiranj, kar opravljajo strokovni delavci za posamezno živinorejsko panogo. Zbiranje podatkov, ocenjevanje živali, kontrolo proizvodnje in označevanje živali, laboratorijske analize ter drugo terensko delo pa večinoma opravljajo terenske službe, ki so na območnih kmetijsko-gozdarskih zavodih ali testnih postajah oziroma na nekaterih seleksijskih farmah.

Podlaga rejskega dela je rejski program za posamezno vrsto oziroma pasmo domačih živali. Rejski program je večleten in opredeljuje seleksijske programe, rejske cilje, metode testiranj, načine obdelave podatkov ter objavljanje. Za izvedbo rejskega programa pripravimo in izvajamo letni program izvajanja strokovnih nalog selekcije, rodovništva in reprodukcije ter nalog službe za kontrolo proizvodnje v živinoreji. Delo pri strokovnih nalogah se po letu 1992 financira iz proračuna RS. Na MKGP od aprila 2000 vodi področje strokovnih nalog v živinoreji samostojen Sektor za zootehniko v Uradu za prehrano, varstvo rastlin, veterinarstvo in zootehniko. V sektorju so zaposleni strokovnjaki za zootehniko. Na MKGP je organizirana služba za identifikacijo in registracijo živali. Naloga službe je vodenje označevanja in registracije ter spremljanje

Organizing of breeding activities

The existing situation

Slovenian legislation regulates most professional activities related to animal husbandry. There are acts that regulate herd books, identification of breeding stock, commerce with breeding stock, selection and pedigree registers, recording and monitoring of production and reproduction. Bee-keeping and fisheries-production sectors are also regulated, as is insemination of domestic animals and the methods of recognition of breeding male animals, marking and identification of breeding animals and keeping the required registers and records.

All of the above assignments are conducted by public institutions, such as the Zootechnical Department of the Biotechnical Faculty of the University of Ljubljana, the Veterinary Faculty, Faculty of Agriculture of the University of Maribor, the Agricultural Institute of Slovenia, regional agriculture and forestry institutions, and other organizations, such as enterprises, cooperatives, associations and individuals. Breeders' organizations actively participate in defining breeding programs and annual work programs. Members of breeders' organizations preside over commissions for recognition of breeding male animals. Professional institutions and establishments, however, remain in charge of all the assignments. Most professional activities are conducted on two horizontal levels. Breeding value prediction, processing of milk recording data and other tests are carried out by the professionals of the relevant animal husbandry branch, and is conducted on the level of the Government. Data collection, assessment of animals, recording production and identification of animals, laboratory analyses and other field work is conducted by field services located at the regional agricultural establishments, test stations, or on some farms that are involved in selection.

The basis for selection is the breeding program of each particular animal species or breed. The program spans several years and defines selection programs, breeding goals, methods of testing, ways of data processing and publishing. To carry out a breeding program, we prepare an annual program of conducting professional selection activities, pedigree register and reproduction, and tasks of the service for monitoring animal husbandry production. Professional activities have been financed by the Government since 1992. As of April 2000, professional activities in the field of animal husbandry have been conducted by an independent Zootechnical Unit within the MAFF. Animal-husbandry professionals are employed in the sector. A service also exists within the MAFF for identification and registration of animals (SIR). The responsibility of this service is to

1.3.5

1.3.5.1

manage identification and registration of animals and monitor animal trade in Slovenia in accordance with the *acquis communautaire*.

Biodiversity of domestic animals gained importance in Slovenia some two decades ago. In 1982, we began to cooperate with the EAAP - European Association for Animal Production. The EAAP established a bank of genetic data on domestic animals. We have provided the bank with the first Slovenian data on autochthonous breeds of domestic animals. Current data on Slovenian autochthonous breeds have become available via all of the most important international databases (DAD-IS, EAAP - AGDB, OKLAHOMA STATE UNIVERSITY - BREEDS). We have also established direct cooperation with many organizations (FAO, EAAP, DAGENE, SAVE) which explore biodiversity in the domain of animal husbandry.

A program of conservation of some autochthonous breeds has been conducted intensively and purposefully since 1991 by a group of researchers at the Zootechnical Department of the Biotechnical Faculty, University of Ljubljana. A research project of conservation of biodiversity in farm animals is being carried out at this institution.

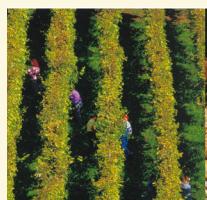
All the animals registered as autochthonous in Slovenia enjoy special protection. In addition to basic research and professional work that includes monitoring of herds, measurement of animals, recording of production traits, selection according to the external appearance of the animal, managing breeding documentation and the pedigree register, directing reproduction, gene tests etc. it is also of high importance in providing compensation for breeders that contribute to conservation of these breeds *in situ*. Such payments for stimulating the conservation of autochthonous breeds are also legally in force in the EU and represent compensation for the loss of profit for animal owners who keep less productive breeds. A particular breed is shaped most decisively by rearing in the autochthonous environment. Such a farming environment is more demanding and the costs are higher. Conditions of this kind require more investment, so production is less profitable.

prometa z živalmi na območju Republike Slovenije v skladu z določili pravnega reda EU.

Pomen biotske raznovrstnosti domačih živali se je v Sloveniji začel povečevati pred približno dvema desetletjem, ko se je leta 1982 začelo sodelovanje z EAAP - Evropskim združenjem za živinorejo, ki je ustanovilo banko genetskih podatkov domačih živali in smo mu sporočili prve podatke o slovenskih avtohtonih pasmah domačih živali. Danes so podatki o avtohtonih slovenskih domačih živalih dostopni v vseh pomembnejših mednarodnih podatkovnih zbirkah (DAD-IS, EAAP-AGDB, OKLAHOMA STATE UNIVERSITY - BREEDS), vzpostavljen pa je tudi neposredno sodelovanje z mednarodnimi organizacijami (FAO, EAAP, DAGENE, SAVE), ki se na področju živinoreje ukvarjajo z biotsko raznovrstnostjo.

Od leta 1991 poteka poseben program ohranjanja nekaterih avtohtonih pasem, s čimer se pospešeno in zelo načrtno ukvarja predvsem skupina raziskovalcev na Oddelku za zootehniko Biotehniške fakultete. Na tej visokošolski ustanovi poteka raziskovalni projekt Ohranjanje biotske raznovrstnosti v živinoreji v Sloveniji.

Vse domače živali, ki so vpisane v register avtohtonih pasem, so pod posebnim varstvom Republike Slovenije. Poleg temeljnih raziskav in strokovnega dela, ki zajema preglede rej, meritve živali, meritve proizvodnih lastnosti, odbiro po zunanjem videzu živali, vodenje rejske dokumentacije in rodovništva, usmerjanje parjenja, genske teste in drugo, je treba zagotoviti tudi denarna nadomestila za tiste rejce, ki te pasme ohranjajo *in situ*. Tako neposredno spodbujanje ohranjanja avtohtonih pasem domačih živali je uveljavljeno v skladu z zakonodajo tudi v Evropski uniji in pomeni nadomestilo za izpad dohodka za rejce, ki redijo manj produktivne pasme. Najbolj je k oblikovanju pasme pripomogla reja v avtohtonem okolju, ki je zahtevnejša in praviloma povezana s težjimi pridelovalnimi razmerami in večjimi stroški. Reja v takih razmerah zahteva večja vlaganja in je zato manj donosna.



Prihodnji razvoj

Zakon o kmetijstvu je leta 2000 določil, da se kot javne službe v kmetijstvu opravljajo tudi strokovne naloge v živinoreji (področja: reprodukcija, selekcija, ocenjevanje PV, ugotavljanje proizvodnih ozziroma delovnih sposobnosti, rodovništvo, spremljanje in napovedi medenja v čebelarstvu) in naloge genske banke (zbiranje in evidentiranje avtohtonega genetskega materiala - avtohtone pasme domačih živali in druge pasme z uporabno vrednostjo, hranjenje in obnavljanje zbranega genetskega materiala, razmnoževanje in izmenjava genetskega materiala).

Slovenija je februarja 2002 sprejela Zakon o živinoreji, ki je usklajen s pravnim redom EU in med drugim določa prihodnjo organiziranost, rejske programe, skupne temeljne rejske programe, ohranjanje genetske variabilnosti in genske rezerve domačih živali. V skladu z določili tega zakona bodo ustanovljene priznane rejske organizacije, odobrene organizacije in druge priznane organizacije. Pристojni organ za živinorejo je Ministrstvo za kmetijstvo, gozdarstvo in prehrano. S tem zakonom je ustanovljen tudi Svet za živinorejo, ki bo kot svetovalni organ ministra za kmetijstvo usmerjal strokovno, gospodarsko in družbeno politiko na področju živalskih genskih virov v Sloveniji.

Future development

1.3.5.2

Professional assignments in the field of animal husbandry (reproduction, selection, BV evaluation, assessment of production and performance of equidae at competitions, pedigree register, monitoring and honey flow forecasting in bee-keeping), and the organisation of a gene bank (collecting and recording autochthonous genetic material - autochthonous breeds of domestic animals and other useful breeds, keeping and renewing the collected genetic material, reproduction and interchange of genetic material, have been determined as an element of public services in the agricultural sector by the Agriculture Act of 2000).

The Livestock Breeding Act was adopted in 2002. It is in accordance with the *acquis communautaire*. The act defines the future organization, breeding programs, and joint basic breeding programs, conservation of genetic variability and genetic reserves of domestic animals. Recognized breeding organizations, approved organizations, and other recognized organizations will be constituted in accordance with the provisions of the Act. The Ministry of Agriculture, Forestry and Food has jurisdiction over animal husbandry. A Livestock Breeding Council has also been constituted with this Act. This will be an advisory instrument of the MAFF and will direct professional, economic, and social policy in the area of animal genetic resources in Slovenia.



ANALIZA SPREMENB POVTRAŠEVANJA V ŽIVINOREJI IN POSLEDICE ZA PRIHODNJO NACIONALNO POLITIKO, STRATEGIJE IN PROGRAME, POVEZANE Z ŽGV



ANALYSING THE CHANGING DEMANDS ON NATIONAL LIVESTOCK PRODUCTION AND THEIR IMPLICATIONS FOR FUTURE NATIONAL POLICIES, STRATEGIES AND PROGRAMMES RELATED TO AnGR

Slovenija je okoljsko zelo občutljiva. Več kot eno tretjino ozemlja je kraškega, rečne naplavine, ki so za kmetijstvo zaradi terena zelo primerne, pa imajo zelo prepustna tla. Oba tipa zemljišč sta zelo občutljiva za neustrezno rabo vseh vrst gnojil in kemičnih sredstev za zaščito rastlin in uničevanje plevela. Zato smo že spoznali, da bo treba prilagoditi število živali na enoto površine kakovosti zemljišč in vprašanje gnoja pri obstoječih velikih koncentracijah razrešiti brez škode za okolje. Tudi kmetijska politika je po osamosvojitvi Slovenije zapisala to v zakonske dokumente. S sprejetjo strategijo razvoja slovenskega kmetijstva v letu 1993 in iz nje izhajajočimi dokumenti se je odločila, da bo v Sloveniji podpirala razvoj ekosocialnega kmetijstva in bo osrednji nosilec kmetovanja družinska kmetija. Ta je najbolj prilagodljiva in najlažje upošteva okoljske in etološke zahteve pri rejih živali. Sočasno lahko tako organizirano kmetijstvo najbolje in najceneje opravi tudi druge naloge, pomembne za ohranjanje poseljenosti dežele, ohranjanje kultivirane zemlje v funkciji ter za pester videz in urejenost krajine, kakršno smo oblikovali skozi stoletja in ki lahko s turizmom in nekaterimi drugimi terciarnimi dejavnostmi omogoči zaposlitev in seveda zaslужek na podeželju. Te vrednote pa bodo v 21. stoletju gotovo še pomembnejše kot so že danes. Ohranjanje poseljene Slovenije in vasi z njihovo kulturno, prehransko in bivanjsko pestrostjo je narodno pomembno in bogati prepoznavnost Evrope. Pri tem pa ima živinoreja z bogastvom avtohtonih pasem, tehnologij reje, načinov predelave in krajevno tipičnih izdelkov nenadomestljivo vlogo. Pri izdelavi krajevno tipičnih izdelkov se posredno ohranja tudi krajevna tipična mikroflora, ki je potrebna za postopke zorenja mlečnih in mesnih izdelkov.

Slovenia is environmentally very vulnerable. More than one third of the territory is limestone karst lands. Alluvial deposits, which might otherwise be appropriate for agriculture, have a porous texture. Both types of land are very susceptible to improper use of fertilizers and chemicals for plant protection and weed control. We have already realized that the number of animals per unit of land will have to be adapted to the land quality. The problem of manure disposal will have to be resolved in a way that does not cause damage to the environment. Agricultural policy included such a strategy in legislation after Slovenia became independent. Within the strategy adopted in 1993, Slovenia committed itself to supporting the development of eco-social agriculture. The family farm has been declared to be the central holder of this function because it can be very flexible and can easily conform to the needs of ecological and ethological demands of animal production. Agriculture thus organized can successfully and cost-effectively implement other tasks which are crucial for the maintenance of rural settlement, the conservation of cultivated lands, a diverse and settled landscape which has been shaped over centuries and can provide employment and income in rural regions through the development of tourism and other services. In the 21st century, these values will probably be even more important than today. It is of national importance to preserve a dispersed type of settlement, e.g. villages, with a rich cultural heritage, diversity of cuisine and architectural styles. This also contributes greatly to the identity of Europe. A very important role is here credited to livestock production that encompasses various locally adapted breeds, rearing and breeding technologies, food processing methods, and characteristic local products. The latter also help in preserving characteristic local microflora needed in the processes of fermentation and maturation of dairy and meat products.

RAZVOJ POLITIK, STRATEGIJ, PROGRAMOV IN PRAKSE V PRIREJI TER NJIHOV VPLIV NA ŽGV

Stanje in razvoj živinoreje v Sloveniji so po 2. svetovni vojni narekovali naravne danosti, povpraševanje po živinorejskih proizvodih in kmetijska politika. Slovenija je imela in ima še danes pribl. 2/3 kmetijskih površin pokritih s travo. Tudi njivske površine niso zelo kakovostne. Za ohranjanje rodovitnosti njiv so morali in morajo kmetje skrbno kolobariti in vključevati v vrstenje kultur predvsem leguminoze (zlasti detelje)

REVIEWING PAST POLICIES, STRATEGIES, PROGRAMMES AND PRACTICES, AND THEIR EFFECT ON AnGR

Since the Second World War, the state and development of livestock production have been influenced by natural conditions, demand for livestock products, and agricultural policy. Approximately two thirds of the Slovenian agricultural land were and still are covered with grass. The arable land is also not of good quality. To maintain the fertility of farmland, farmers have been practicing extensive crop rotation and have been growing legumes

(mainly clovers) and forage crops. For these reasons, ruminants have always been and will remain the most important group of farm animals. An important share of agricultural grasslands can only be preserved for production with grazing, particularly by small ruminants. All this has resulted in Slovenia being in the past and remaining almost self-sufficient in the production of beef, sheep and goat meat, while in milk production it even has some trade surpluses. On the other hand, we have always had very little arable land. Today, there are less than 10 ares per inhabitant. Consequently, we produce only half of the cereals needed for human consumption and animal feed. Modern pig and poultry production depends almost completely on imports of feed.

Around 1950, five breeds were kept for production in Slovenia: Simmental, Slovenian Brown, Cika, Pomurska (Murboden) cattle, and Slovenian White. These were all dual-purpose breeds used for both milk and meat production. The animals, especially oxen, were also used for work. Cows were used on loose soils in the lowlands. Soon after 1950, induced also by political activity, artificial insemination of cows became widespread. Influenced by the policy in Europe, livestock production experts of that period decided to abolish the Cika, Pomurska cattle, and Slovenian White breeds. These breeds were replaced by or remelt with Simmental and to some extent the Slovenian Brown breed. In the late 50s, it became increasingly lucrative to sell young fattened bulls of the Simmental breed, especially to Italy, so this breed began to spread very rapidly. The authorities encouraged the introduction of the Black and White breed from abroad in order to supply the growing urban population with milk. This breed was kept in the newly established state farms.

In the 70s, it became evident that the newly established large state farms could not provide enough milk, so the politicians allowed an expansion of private farms for milk production. Because of slurry problems, the concentration of animals on state enterprises began to fall. They started to adapt the farm size to the area available for feed production and disposal of manure. At the same time, advisory services began to develop. Around 1970, small family farms supplied large state and cooperative farms with calves for fattening. Fattening of small herds was financially less attractive. Fattening of cattle was not initiated by farmers until the 90s when it became possible to acquire more land for production of fodder, either by renting or purchase. Milk production grew rapidly in the 80s, with an increasing number of private farms and milking cows being involved in milk delivery. These numbers grew until as late as 1985. This coincided with production intensity and an opportunity of acquiring higher income with milk than from production of meat with small herds. After 1985, concentration in milk production began and this process still continues. The

in krmne rastline. Zaradi obojega so bili, so in bodo ostali prežvekovalci med domačimi živalmi najpomembnejši. Kar lep del travnatih kmetijskih površin lahko ohranimo za pridelavo hrane le s pašo, zlasti drobnice. Vse to je razlog, da je bila in je stopnja samoskrbe z mlekom in večino mesa prežvekovalcev dovolj velika za domače potrebe, pri mleku so tudi tržni presežki. Njivskih površin smo imeli vedno malo, v zadnjem času jih je že manj kot 10 arov na prebivalca. Zato pridelamo le približno polovico potrebnih krušnih žit in žit za živalsko krmo. Sodobna prašičereja in perutninska priteja sta skoraj povsem odvisni od uvoza krme.

Okrog leta 1950 smo redili v Sloveniji pet pasem govedi – lisasto, rjavo (sivorjavo), cikasto, pomursko (pšenično) in slovensko belo (marijadvorsko). Vse pasme so bile kombinirane. Z njimi so priejali mleko, meso in živali uporabljali tudi za delo, največ vole, v ravninah z lažjimi tlemi pa tudi krave. Kmalu po letu 1950 se je – tudi s pomočjo politike – razmahnilo osemenjevanje krav. Takratni živinorejski strokovnjaki so se po evropskem vzoru odločili za ukinitve marijadvorskega, pomurskega in cikastega goveda. Te pasme so zamenjali ali pretopili predvsem z lisasto in delno z rjavo pasmo. Proti šestdesetim letom se je dalo čedalje bolje prodajati mlade spitane bike lisaste pasme, zlasti v Italijo, zato se je ta pasma hitro širila. Za preskrbo mestnega prebivalstva, ki je bilo v porastu, z mlekom pa so s podporo takratne politike začeli uvažati črno-belo govedo, ki so ga redili na novo zgrajenih državnih farmah.

V sedemdesetih letih se je pokazalo, da ustanovljena posestva ne morejo zagotoviti dovolj mleka in politiki so dovolili razvoj kmetij, usmerjenih v priejo mleka. Zaradi težav z gnojevko so se v tem času že začele zmanjševati tudi koncentracije živali na največjih državnih farmah – njihovo število je bilo prilagojeno razpoložljivim površinam za pridelovanje krme in uporabo gnoja. Sočasno pa se je začelo pospeševati tudi strokovno delo za potrebe kmetij. Okrog leta 1970 so kmetije v velikem delu oskrbovale velika pitališča goved na državnih posestvih in v zadrugah s teleti za pitanje. Zaradi delovne ekstenzivnosti je bilo pitanje majhnih čred na kmetijah dohodkovno manj zanimivo. Govedo so kmetje začeli v večji meri rediti šele v devetdesetih letih, ko so lahko prišli do večjih površin zemlje za pridelavo krme z najemom ali nakupom. Priteja mleka na kmetijah pa je v osemdesetih letih hitro rasla in vse več kmetij in krav je bilo vključenih v priejo in odkup mleka. Število se je povečevalo do leta 1985. To je sovpadalo z delovno intenzivnostjo pri priteji mleka in možnostjo doseganja večjega dohodka kot v priteji govejega mesa z majhnimi čredami. Po tem letu pa se je začela koncentracija priteje mleka na kmetijah, ki še stalno poteka.

Število krav, vključenih v odkup mleka, se je do danes zmanjšalo za dobro tretjino, število kmetij pa na 30 % takratnih.

Zaradi že omenjenega pomanjkanja krmnih žit je prašičereja po 2. svetovni vojni temeljila predvsem na korenovkah in krompirju. Tak sistem reje je zahteval veliko dela in je bil takrat zaradi razpoložljive cenene delovne sile mogoč. To pa je omogočalo zelo dobro izkoriščanje površin - veliko pridelanih hranilnih snovi na enoto površine in zelo ustrezni kolobar. Pomembna je bila zlasti prireja masti, zato so takrat redili mastne pasme prašičev. Znana sta bila črno pasasti prašič (krškopoljski prašič) in prašič bele nemške pasme. Z večanjem števila delavcev in mestnih prebivalcev se je povečalo predvsem povpraševanje po mesu. Ko se je konec petdesetih let politično ukinilo zadružništvo ter začel program industrializacije kmetijstva, so začeli širiti mesnate tipe prašičev in graditi večje prašičarske farme. Gradnjo večjih farm so utemeljevali tudi z uspešnejšo selekcijo. Do sredine osemdesetih let so tudi kmetje za samooskrbo uvedli mesnate tipe prašičev, vendar so jih le občasno prodajali. S pojavom prvih opozoril o ekološki škodljivosti velikih koncentracij se je začelo pospeševati tudi usmerjanje kmetij v tržno prašičerejo. Najboljše kmetije so se sčasoma preoblikovale v rejska središča in so vključene v intenzivno selekcijo. Največja težava večjih koncentracij je, da gnoja ni mogoče gospodarno uporabiti na površinah za pridelavo krme za te živali. V zadnjem času se pojavljajo rešitve z uporabo gnojevke za pridobivanje bioplina, vendar z dosedanjimi dognanji ni mogoče rešiti temeljnega vprašanja, to je uporabe rastlinskih hranil iz gnojevke za pridelavo krme, in zato te rešitve niso povsem sonaravne.

Takoj po 2. svetovni vojni je bilo slovensko perutninarnstvo izrazito samooskrbno in so se proizvodi le v manjšem delu pojavljali na trgu. Jajca so odkupovale predvsem zadružne trgovine in jih dajale na trg v porabnih središčih. Z uveljavitvijo koncepta industrializacije slovenskega kmetijstva so pospešeno začeli graditi perutninske farme, ki so že konec šestdesetih let organizirale razpršeno pitanje piščancev na kmetijah. Tako so se izognile težavam z gnojem, ki so ga kooperanti in sosedje s pridom uporabljali na svojih kmetijskih površinah in s tem povečevali pridelke. Ta razpršenost je pripeljala na vas tudi precej kapitala, ki je blažil socialne težave. Zlasti prireja mesa je bila vse do osamosvojitve Slovenije zelo donosna. S prirejenim mesom smo zadovoljili vse slovenske potrebe in v najboljših letih smo enako količino mesa prodali tudi v južne republike. Taka usmeritev se je po letu 1990 pokazala za zelo vprašljivo, ker uvažamo plemenski material in krmo. V začetku intenzifikacije perutninarnstva se je uvajala tudi reja rac, ki pa je bila predvsem zaradi zdravstvenih vprašanj kmalu opuščena. V zadnjem desetletju pa se povečuje povpraševanje po purjem mesu, zato se širi pitanje pur. Za ta na-

number of cows involved in milk delivery has now decreased by more than a third, with only 30 % of the 1985 number of farms still participating.

Due to the already mentioned coarse grains shortage in the period immediately after the Second World War; pig production was based mainly on root crops and potatoes. Such a system of production demanded hard work and was possible at the time because of cheap labour. The land was exploited efficiently & plenty of nutritional stuffs were produced per surface unit and a very suitable rotation system was used. Production of lard was of special importance so emphasis was put on production of extensive breeds of pigs. Krsko Polje pigs as well as German White breed were well known. The increase in the urban population in particular influenced the demand for meat. In the late 50s, cooperatives were abolished by political decision and the industrialization of agriculture began. This brought about an expansion of meat breeds of pigs and the advent of large state pig farms. The creation of such large farms was also based on more successful selection of breeding animals. By the mid-eighties, subsistence farms had also introduced meat pig types but sold them only occasionally. The first warnings of ecological damage were accompanied by an increase in commercial pig production on private farms. The most successful farms were gradually reorganized into breeding centres and today participate in intensive selection. The fundamental problem of large concentrations of animals is that manure cannot be economically utilized on the land on which feed is being produced for these animals. Recently, the use of slurry for biogas has been exploited; however, the main problem remains unsolved, that is, the use of plant nutrients from slurry in order to produce feed. So these solutions are not entirely sustainable.

In the period immediately after the Second World War, poultry was kept mostly on subsistence farms and only a small proportion of products appeared on the market. Eggs were bought by co-operative stores and directed to the consumer centres. With the industrialization of Slovenian agriculture, large poultry farms were introduced. In the late sixties, dispersed fattening of the chickens on family farms was organized. Farms thus avoided manure disposal problems. The manure was used by cooperators and their neighbours, who thus increased crop yields. The benefits thus gained mitigated social problems in rural areas. Poultry meat production was very profitable until the independence of Slovenia. All the meat needs were met and, in the best years, almost the same amount of meat was also exported to the other republics of former Yugoslavia. This policy became questionable after 1990, because breeding animals as well as feed is being imported. With the beginning of mass poultry production, ducks were also introduced but this was soon abandoned due to health hazards. In the last decade there has been

a high demand for turkey, so fattening is increasing. Former chicken sheds have been adapted for this purpose. Most eggs found in the shops today have been produced on a few large farms owned by poultry production companies. Many individual farms still keep poultry for their own use. Some farmers keep ostriches as well. Non-professional hobby breeders, however, boast the highest variety of species (chickens, ducks, geese, turkeys, guinnea fowl, and pigeons).

Due to the great diversity of landscape and the high share of grasslands in Slovenia, small ruminant production was fairly well developed in past centuries. This production provided milk, meat and clothing for people. At the beginning of the 20th century, its role slightly diminished and after the Second World War, it regressed considerably with the bottom being reached in the mid eighties. Experts became aware of the possible consequences of such a reduction of the animal population. Less favourable and more remote areas, particularly the karst lands remained ungrazed, so shrub and tree overgrowth took over. The areas became prone to fires. Influenced by western societies, where quality lamb meat was very popular, breeding programs for improving and upgrading Slovenian autochthonous breeds were initiated in order to produce meat and milk. The animal population increased again and today it is ten-fold compared to the lowest number in the mid-80s. The demand for lamb of high quality and for cheese made from sheep milk is constantly increasing. Larger farms with a few tens or even a few hundreds of animals have developed. The number of goats is also rising. Slovenian Saanen and Slovenian Alpine goats predominate in production. In the hinterland of Ljubljana, there is an increased interest in raising Boer meat goats. According to censuses, there were 16,600 breeding goats in Slovenia in 2000.

Until the introduction of the tractor, the horse was the most important aid in cultivation of agricultural land and in work in the forests. In Slovenia, cold-blooded breeds predominated. Lipizzan horses and Ljutomer Trotters were the most important warm-blooded breeds. When the tractor was introduced, the role of horses in agriculture decreased, so the number of horses was reduced. However, in the last twenty years, horses have again played an important part in sports and recreation. In addition to the above mentioned breeds, multi-purpose horses have also gained in importance: the Hannoverian, Slovenian warm-blooded horse and Haflinger can be effectively used both for work and sport due to their gentle nature. The demand for horse meat is present all the time and is even on the increase. The Lipizzan, which is one of the oldest cultural horse breeds in the world, originates in Slovenia. Its origins are in Lipica, on the Karst, the region after which the horse breed got its name. The genetic foundation for the Lipizzan horse is the Karst horse, which is demonstrated by the fact that, even though these

men se večinoma prilagajajo nekdanji hlevi za pitanje piščancev. Danes je večina jajc, ki najde svoje mesto v trgovinah, prirejena na nekaj večjih farmah v lasti perutninarskih podjetij. Posamezne kmetije redijo perutnino za samooskrbo. Nekaj rejcev redi tudi noje. Največja pestrost vrst in pasem perutnine je pri ljubiteljih (kokoši, race, gosi, pure, pegatke, golobi).

Zaradi že omenjene razgibanosti površin in velikega deleža travinja je bila reja drobnice v Sloveniji v preteklih stoletjih zelo razvita. Ljudem je dajala mleko, meso in jih oblačila. V začetku 20. stoletja je nekoliko izgubila pomen, pomembno nazadovanje pa se je začelo po 2. svetovni vojni in doseglo najnižjo raven sredi osemdesetih let. Strokovnjaki so se začeli zavedati posledic zmanjševanja staleža. Slabše in odmaknjene površine, zlasti kraške, so ostale nepopašene in se začele zaraščati. Širiti so se začeli požari. Pod vplivom Zahoda, kjer je bilo meso kakovostnih jagnjet zelo cenjeno, so bili tudi pri nas izdelani programi oplemeniteva naših avtohtonih pasem za prirejo mesa in mleka. Stalež se je ponovno začel dvigovati in je dosegel že približno desetkratno število v primerjavi z najnižjim. Tudi povpraševanje po kakovostnem mesu mladih jagnjet in sirih iz ovčjega mleka se nenehno povečuje. Oblikovalo so se večje kmetije, ki redijo nekaj 10 ali celo nekaj 100 živali. Tudi število koz se je začelo povečevati. Pretežno so se oblikovali tropi koz za prirejo mleka. Prevladujeta slovenska sanska in slovenska srnasta pasma koz. Zlasti v zaledju Ljubljane pa je vse večje zanimanje za rejo burske – mesne pasme koz. V Sloveniji je bilo po podatkih popisa v letu 2000 16 600 plemenskih koz.

Do pojava traktorja je bil konj najpomembnejši za obdelavo kmetijske zemlje in tudi delo v gozdu. V Sloveniji so prevladovale hladnokrvne pasme, od toplokrvnih pa sta bila najpomembnejša lipicanski konj in ljutomerski kasač. Z uveljavitvijo traktorja se je pomen konj za delo v kmetijstvu zmanjševal, zato je njihovo število hitro padalo. V zadnjih 20 letih pa se povečuje pomen športnega konja in konja za rekreacijo. Poleg že omenjenih pasem so se zato uveljavili večnamenski jahalni konji: hanoveranci, slovenski toplokrvni konj in haflingerji, ki so zaradi svoje mirnosti zelo primerni tako za delo ter šport in rekreacijo. Tudi povpraševanje po konjskem mesu je stalno in se celo povečuje. Slovenija je kraj nastanka lipicanskega konja, ki je ena najstarejših kulturnih pasem konj na svetu. Njeno ime se navezuje na Lipico, kraj izvora pasme na slovenskem Krasu. Lipicanu je dal osnovo kraški konj, kar še najtehneje dokazuje dejstvo, da so v začetku, ko so kraške konje že začeli križati z uvoženimi, to pasmo vodili pod imenom "konji kraške pasme lipicanske reje".

Nastala je v Kobilarni Lipica, ki jo je leta 1580 ustavil avstrijski nadvojvoda Karel. Lipicanca so izoblikovali s križanjem tedanjih kraških, španskih in neapo-

litanskih, pozneje pa še kladrubških in arabskih konj. V 19. stoletju se je pasma razširila v številne dežele tedenje avstro-ogrške monarhije – Hrvaško, Madžarsko, Romunijo, v 20. stoletju pa še v Italijo in Slovaško, kjer so nastale državne kobilarne. Zdaj ga redijo v več kot 27 državah Evrope, Afrike, Amerike in Avstralije.

Kunci so imeli za prirejo mesa v Sloveniji kar pomembno vlogo. V marsikaterem hlevu so živelji skupaj z govedom. Z novogradnjami in preuređitvijo teh hlevov je takšna reja propadla. Ves čas po 2. vojni pa so kunce redile in jih še redijo delavske družine, ki poleg hiše premorejo še malo zemlje. To je izrazito samooskrbnova kuncereja. Kakih 5 tisoč kunk pa je tudi v tržno organizirani kuncereji. Zato je mogoče kunčje meso kupiti tudi v trgovinah.

Gojenje kranjske čebele je bilo na slovenskih tleh že stoletja uveljavljeno. Tržni proizvod niso bili samo čebelji proizvodi, ampak tudi plemenske matice, zato se je intenzivno rejsko in selekcijsko delo pri čebeli začelo že zgodaj, aktualno pa je še danes. Prizadevanja za ohranitev kranjske čebele so torej že stara. Najrazločneje je postavljena zahteva po njenem varstvu v znameniti Spomenici Odseka za varstvo prirode in prirodnih spomenikov pri Muzejskem društву za Slovenijo, objavljeni leta 1920. Tam beremo: "Varuje naj se tudi kranjska čebela kot naravni spomenik, dokler ne izide nov čebelarski zakon, ki naj zadošča potrebam varstva te pasme. Na Kranjskem (del Slovenije) in sosednjem delu Koroške se je razvila tokom stoletij posebna pasma vrste Apis mellifica L., ki ima stalne bistvene lastnosti in ki jo znatno razlikujejo in tudi odlikujejo od vseh lokalnih pasem. S prirodopisnega in narodnogospodarskega stališča je potrebno, da se kranjska pasma ohrani. Nevarnost, ki preti tej pasmi, ne obstoji v tem, da bi se čebelarstvo v naših krajih opustilo, marveč v tem, da bi se ta pasma pomešala z drugimi pasmami in na ta način izgubila svoje specifične vrline. Zato naj se prepove uvoz živilih čebel in matic v kraje, kjer je doma kranjska čebela. Ker se naša pasma najbolj množi (roji), tudi potrebe po uvozu ni, tudi če bi se čebelarstvo še tako širilo." Zahteva, postavljena v Spomenici, se je uresničila v Zakonu o živinoreji (2002), ki v 70. členu določa, da "zaradi varovanja obstoja avtohtone kranjske čebele na območju Republike Slovenije nista dovoljena reja in promet s plemenskim materialom drugih pasem čebel".

horses had already been cross-bred with imported breeds, they were initially catalogued under the name of "Horses of Karst breed and Lipica production".

This breed emerged from the Lipica Horse Stud Farm established in 1580 by Archduke Charles. The Lipizzan horse was finally shaped by cross-breeding the then existing Karst, Neapolitan and later also Kladrub and Arabian horses. In the nineteenth century, the breed spread to the lands of the then Austro-Hungarian Monarchy – Croatia, Hungary, Romania, and in the 20th century to Italy and Slovakia, where state stud farms were established. Today, the Lipizzan horse is bred in more than 27 countries of Europe, Africa, America, and Australia.

Rabbits have also been important in meat production in Slovenia. They were kept together with cattle in many stables. With modern constructions and adaptations of former sheds, such breeding has been abolished. After the Second World War, rabbits have been kept by workers' families who also own some land. This kind of production serves only subsistence purposes. Approximately 5,000 rabbit does are kept in commercial production, so rabbit meat can also be purchased in shops.

The breeding of the Carniolan honey bee has been taking place in Slovenia for centuries. In addition to products made by bees, queen bees were also included in trade. Intensive production and selection of the bee started very early and is still taking place today. The demand for protection of the Slovenian honey bee was made very clearly in the famous Charter for protection of nature released by the Slovenian museum association in 1920 where it is stated: "Carniolan honey bee should be protected as a natural monument until the new legislation aimed at protection of this breed is issued. In Kranjska (Carniola, part of Slovenia) and the neighbouring part of Koroska (Carinthia) a special breed has developed in the course of centuries, the species Apis mellifica L. which has characteristic traits and significantly differs from all other local breeds. From the point of view of natural studies and the national economy, it is of great importance for the breed to remain preserved. The breed is not threatened by the abandoning of bee production, but by the possibility of the Carniolan breed cross-breeding with other breeds and thus losing its distinguishing characteristics. Therefore the import of live bees and queen bees should be banned from places where the Carniolan bee is raised. The Carniolan honey bee breeds well, so import is not needed even in the event of future expansion of bee production." The demand for protection from the above Charter was materialized in the Livestock Breeding Act, which in Article 70 prohibits the introduction or rearing of and trade in other bee breeds to and in Slovenia.



SPREMEMBE PREHRANSKIH NAVAD PORABNIKOV IN SPREMEMBE V POVTRAŠEVANJU

V zadnjem obdobju demografska gibanja v Sloveniji pomembneje ne vplivajo na povpraševanje po živalskih proizvodih in tudi v bližnji prihodnosti ni pričakovati večjih sprememb zaradi gibanj prebivalstva. Zasledujemo pa lahko spremembe v povpraševanju po posameznih proizvodih, ki izhajajo iz povečane kupne moči, ozaveščenosti in navad porabnikov, prevzetih od sosednjih narodov. Primer za to je povečana poraba jagnjetine, fermentiranih mlečnih izdelkov, rib ipd. Tu pričakujemo spremembe tudi v prihodnje. Posebno pozornost bodo porabniki namenjali prehranski kakovosti. Prednost pri nakupu bo imelo pusto meso. Z novim znanjem o sestavinah živil bo vse več ljudi dajalo prednost živilom, za katera velja prepričanje, da ne povzročajo najpogostejejših sodobnih vrst bolezni (bolezni srca in ožilja itd.).

Porabniki v Sloveniji se vse bolj zavedajo, da je zdravje mogoče zagotoviti le v zdravem okolju. Med pogoji za zdravo okolje pa je tudi sonaraven način reje živali, ekološko in etološko ustrezena reja. Že danes daje precejšen del porabnikov pri nakupu prednost proizvodom iz ekološko in etološko primernih rej. Število porabnikov, občutljivih za način pridelave in predelave, se bo povečevalo in do rejcev bodo imeli vse več in vse večje zahteve. Zato bodo vse pogosteje odklanjali izdelke živali, ki jim bo med rejo onemogočeno izražanje zanje značilnih etoloških navad in ki bodo imele v obroku sestavine kemične ali biotehnološke sinteze (gensko spremenjene sestavine, snovi, ki spodbujajo rast, hormoni ipd.). Temu se bodo laže prilagajali rejci, ki že danes živali večinoma redijo razmeroma ekstenzivno, za te dodatne zahteve pa bodo morali biti tudi ustreznno nagrajeni.

TRENDS IN CONSUMER PREFERENCES AND CHANGES IN DEMAND

2.2

Demographic changes in Slovenia have in recent times not significantly influenced the demand for animal products and no important changes in this area are expected in the near future. However, a higher demand for certain products can already be observed, probably due to the higher purchasing power of consumers, their health awareness, and dietary habits adopted from neighbouring countries. This is the case with an increase in consumption of mutton and lamb, fermented dairy products, fish etc., and these trends are expected to continue in the future. Special attention will be paid to nutrition quality, such as a preference for lean meat. With better knowledge of the nutritional values of foodstuffs, consumers will give preference to food products that are believed not to cause modern diseases (such as cardio-vascular diseases etc.).

Consumers in Slovenia are increasingly aware that health can only be provided in a healthy environment; and a healthy environment is conditioned by - among other factors - sustainable animal production, both ecologically and ethologically. Consumers will be ever more conscious of production and processing methods and in the future their attitude to producers will become more complex. They will reject products made from animals that did not have proper rearing conditions to meet ethological needs, and products containing substances of chemical or biotechnological synthesis (genetically modified substances, growth promoters, hormones, etc.). Farmers in extensive production will meet these requirements more easily; however, they will need to receive some additional benefits.

DISCUSSION OF ALTERNATIVE STRATEGIES IN THE CONSERVATION, USE AND DEVELOPMENT OF AnGR

The small size of Slovenian farms results from two basic facts: the agro-political situation, and limitations of natural resources. From the end of the Second World War until independence (1991), the law prohibited the construction of large-scale private farms and it limited trade in agricultural land. Therefore the structure of family farms remained almost unchanged for four decades, while breaking up farm parcels into smaller units increased, influenced also by vestiges of the laws on inheritance. Rapid changes are not to be expected soon, not even after the statutory restrictions have been eliminated. The economy is not strong enough to provide new jobs in agricultural regions. Changes could be accelerated by the modernization of the land legislation. An effective rural development project is also urgent.

Historically and politically fragmented production has had and will continue to have in the future a significant impact on the directions and technologies of livestock production in Slovenia. In remote areas, due to the fragmentation of plots and unfavourable farm land, it is very difficult to organize farms of a sufficiently large scale farms to be viable by pursuing extensive production technologies alone. Only mixed farms can survive in such conditions, as part of their income comes from activities other than agriculture. For such farms, non-intensive technologies are very appropriate since they enable the land to be productively exploited. Farms which specialize in production of suckler cows, and meat sheep and meat goats are especially vital. There also exist entirely agricultural farms, which manage to acquire enough contiguous agricultural land for modern and efficient production. Smaller and more enterprising farms often organize their own processing and selling of products. Most of them organize selling independently but it can be expected that in the future they will link up with each other on a co-operative level and will place their products on the market together. Some of these farms have been selling their products at home and will continue doing so in the future. Many of them sell their services via tourist channels. More and more farms are participating in organic production and the pertaining quality controls. A verified label on organic production will guarantee sales, frequently on much better financial

ALTERNATIVNE STRATEGIJE ZA OHRANJANJE, RABO IN RAZVOJ ŽGV KOT ODGOVOR NA SPREMEMBE V POVPRÄŠEVANJU PO ŽIVALSKIH PROIZVODIH

Za majhnost slovenskih kmetij sta predvsem dva razloga: kmetijsko-politični in omejenost naravnih danošči. Od konca 2. svetovne vojne do osamosvojitve (leta 1991) je zakon preprečeval nastajanje večjih kmetij in omejeval promet s kmetijskimi zemljišči. Zato se sestava naših kmetij štiri desetletja ni spreminala, drobljenje parcel pa se je še povečevalo – tudi zaradi vpliva dedne zakonodaje. Hitrih sprememb tudi po odpravi omejevalne zakonodaje ni pričakovati, ker bi zanje moralo biti gospodarstvo dovolj močno, da bi na kmetijskih območjih ustvarilo nova delovna mesta. Za hitrejše spremembe na tem področju bi morali posodobiti zemljiško zakonodajo, potrebovali pa bi tudi učinkovit projekt razvoja kmetijskih območij.

Zgodovinsko in politično povzročena razdrobljenost proizvodnih dejavnikov vpliva in bo tudi v prihodnje precej vplivala na usmeritve in tehnologije reje domačih živali. Na odmaknjene območjih je zaradi parcelne razdrobljenosti in težavnosti terena zelo težko organizirati tako velike kmetije, da bi se lahko preživljale samo z delovno ekstenzivnimi tehnologijami proizvodnje. Zato so se in se bodo tu obdržale predvsem mešane kmetije, ki dobivajo del dohodka zunaj kmetijstva. Za takšne kmetije so delovno ekstenzivne tehnologije, ki zagotavljajo izkoriščanje površin, zelo primerne. Med temi se oblikujejo zlasti kmetije, usmerjene v rejo dojlj in mesne drobnice. Med njimi so tudi čiste kmetije, ki jim na teh območjih uspe dobiti dovolj zemljišč v zaokroženih površinah, da lahko organizirajo sodobno in učinkovito rejo. Manjše od teh in podjetnejše pa marsikdaj organizirajo predelavo in prodajo svojih proizvodov. Večina jih organizira prodajo samostojno, realno pa je pričakovati, da se bodo v prihodnosti povezale na zadružni podlagi in nastopile na trgu povezane. Nekatere od teh kmetij so si in si bodo organizirale tudi prodajo na domu. Marsikatera prodaja tudi prek stacionarnega ali izletniškega turizma. Vse več takih kmetij se odloča za ekološko rejo in se vključuje v obstoječ nadzor nad ekološko pridelavo. S pridobljeno oznako o ekološko pridelanih živilih pridobijo možnost zanesljive prodaje, običajno po višjih cenah. Realno je pričakovati povečanje števila kmetij z ekološko prirejo, ker tudi kmetijska politika s programom SKOP finančno podpira takšno prirejo.

Številne kmetije imajo ob vse večjem poudarjanju prepoznavnosti proizvodov možnosti za prirejo in predelavo živalskih proizvodov v krajevno tipične in tudi zaščitene proizvode. Pogosto je izdelava takih proizvodov povezana z revo avtohtonih pasem v neokrnjenih naravnih okoljih (teleče in goveje meso iz ekološke reje, mlečni izdelki iz ekološke reje, jajca iz ekološke reje).

Razvoj in ohranitev alternativnih tehnologij v odmaknjenih območjih bosta zagotovila ohranitev živilih vasi, te pa bodo zaradi okoljsko prijaznih tehnologij zanimive tudi za nekmečko prebivalstvo. Vse več okoljsko ozaveščenih ljudi bo že leto živeti v takšnih vaseh in si prizadevalo organizirati delo na domu, kar sodobne telekomunikacijske tehnologije že v veliki meri omogočajo. Ti prebivalci bodo zainteresirani za urejeno okolje na vasi, in ker bodo živeli s kmeti, bodo bolje razumeli težave in potrebe kmetijstva ter ga bodo pravljeni zagovarjati.

Zelo pomembno je, da bodo v takih vaseh skupaj živeli kmečki in nekmečki otroci, ki bodo zato bolje poznali kmečko življenje, njegove naloge in vrednote, s čimer se bo ustrezan odnos prenašal na prihodnje generacije.

terms. The number of such farms is expected to increase, given that the Slovenian agro-environmental program provides financial support to production of this kind.

With an increasing emphasis given to product identity, many farmers see their opportunity in producing such animal products and their processing into typical local products, sometimes also with geographical protection. This is usually related to rearing autochthonous breeds in an intact natural environment, for example beef and veal from organic farming, eggs from organic farming etc.

The development and maintenance of alternative technologies applied in remote areas will enable the conservation of inhabited villages which will, due to the use of environment friendly technologies, become attractive to the non-farming population, too. More and more environmentally-aware individuals will desire to live in such villages and will carry out their work from home, which is already practicable due to the advancement of information technologies. These individuals will be interested in well-designed villages, where they will live along with farmers. They will gain better understanding of the farmers' needs and will be prepared to speak in favour of agriculture.

It is very important that children of farmers and non-farmers live together in such villages. Knowledge of farm life, farm duties and values will be better, and will be passed on to future generations.



2.4 OUTLINING FUTURE NATIONAL POLICY, STRATEGY AND MANAGEMENT PLANS FOR THE CONSERVATION, USE AND DEVELOPMENT OF AnGR

To preserve animal genetic resources, we need to implement the legislation that has been passed since the independence of Slovenia, and has set the foundations for an eco-social agricultural policy. Such a policy also dominates in the strategic documents of the EU and is advocated especially by Austria, Bavaria, and an important part of France with similar natural conditions as found in Slovenia. The strategy is also pursued by the European eco-social forum, which was established in 2001 with the seat in Vienna.

Eco-social development consents only of such sustainable animal production as takes into account not only basic environmental and ethological requirements, but the needs of producers, too. Such a form of animal production employs only sustainable methods in feed production, with the use of mineral fertilizers and pesticides, which is limited to the period of plant growth and development. The use of insecticides and pesticides is allowed only in the case of extreme need (e.g. epidemics). The use of compound feed for ruminants is permitted only to levels that do not affect the characteristic physiological processes of animals.

The greatest efficiency in the use of on-farm produced energy and proteins is obtained in the production of milk, so it would be advantageous to increase the use of milk and dairy products to the level of production achieved in the developed Central European countries. In this way the population would be well and cost-effectively supplied with animal proteins and the land needed for feed production would be used most effectively. A rational agricultural policy is needed to make good use of various resources (financial resources, media, advertising, etc) in order to achieve this goal.

If we want to successfully introduce extensive technologies for cattle, small ruminants, and horse production in the more remote areas, it will be necessary to speed up reforms in the land structure, such as the merger of individual small plots of land. Only sufficiently large plots will enable efficient production of cattle herds and small ruminant flocks, based on cheap pasturing. This calls for completion of the present legislation.

In the more remote areas where extensive technologies for the raising of autochthonous breeds of farm animals will be put into effect, it will be necessary to use local

IZHODIŠČA ZA NACIONALNO POLITIKO, STRATEGIJO IN NAČRT UPRAVLJANJA ZA OHRANJANJE, RABO IN RAZVOJ ŽGV

Za ohranjanje obstoječih živalskih genskih virov so pomembni po osamosvojitvi Slovenije sprejeti zakoni in uredbe, ki so utemeljili ekosocialno usmerjeno kmetijsko politiko. Taka usmerjenost prevladuje tudi v strateških dokumentih EU in jo zagovarjajo zlasti Avstrija, Bavarska in velik del Francije s podobnimi naravnimi danostmi, kot jih imamo v Sloveniji, na njej pa temelji tudi delovanje leta 2001 ustanovljenega evropskega ekosocialnega foruma s sedežem na Dunaju.

Ekosocialno gibanje kot edino sprejemljive zagovarja le sonaravne (trajnostne) oblike živinoreje, ki ob zagotavljanju osnovnih ekoloških in etoloških zahtev enakovredno upoštevajo tudi rejca živali. Seveda vključuje taka živinoreja le sonaravne oblike pridelave krme z omejeno uporabo mineralnih gnojil in pesticidov v najprimernejšem času – med razvojem rastlin. Uporaba insekticidov in fungicidov je dovoljena le pri preseženem pragu škodljivosti – v skladu z določili integriranega pridelovanja po načelih dobre kmetijske prakse. Uporaba močne krme v obrokih za prežvekovalce je dovoljena do obsega, ki ne prizadene fizioloških procesov, značilnih za živali.

Ker je učinkovitost izkoriščanja na kmetijskih površinah pridelane energije in beljakovin v živinoreji največja pri prireji mleka, bi bilo smiselno pospeševati porabo mleka in mlečnih izdelkov na raven, doseženo v razvitih srednjeevropskih državah. S tem bi lahko najceneje zagotovili oskrbo prebivalcev s potrebnimi živalskimi beljakovinami in hkrati najučinkoviteje izkoristili površine za pridelovanje krme. Pametna kmetijska politika bi morala izkoristiti potrebne vzvode (finančne, medijske, spodbujevalne itd.) za doseg tega cilja.

Če želimo na odmaknjenih območjih uspešno uveljaviti ekstenzivnejše tehnologije reje goved, drobnice in konj, bo nujno treba povečati dejavnosti za izvedbo zemljiških operacij, zlasti komasacij. Le primerno velike parcele omogočajo učinkovito pašno rejo večjih tropov in čred. V ta namen bo treba dopolniti zakonodajo.

Na tistih odmaknjenih območjih, na katerih bodo organizirane ekstenzivne tehnologije reje z avtohtonimi vrstami domačih živali, bo nujno treba spodbuditi kakovostne oblike krajevno tipične predelave živalskih proizvodov. Doseči je potrebno zaščito tehnologij in proizvodov ter dobro organizirati njihovo trženje (tol-

minski sir, savinjski želodec, prekmurska šunka, meso iz tunke idr.). Take reje in predelava lahko pomembno prispevajo k ohranitvi staleža živali in k izkoriščanju kmetijskih površin na teh območjih, kar vse prispeva k videzu krajine.

techniques for high quality processing of animal products. It is essential to protect these technologies and products in terms of intellectual property. This should be accompanied by efficient marketing of produce, such as local cheese and meat products. Such production and processing will add importantly to the continuance of the livestock population. The land will thus be exploited well and the distinctive features in the countryside and the entire landscape will be preserved.



PREGLED STANJA NACIONALNIH ZMOGLJIVOSTI IN OCENA ZAHTEV V PRIHODNOSTI



REVIEWING THE STATE OF NATIONAL CAPACITIES AND ASSESSING FUTURE CAPACITY BUILDING REQUIREMENTS

PREGLED STANJA NACIONALNIH ZMOGLJIVOSTI

Institucionalna in organizacijska struktura za posamezne dejavnosti, povezane z ŽGV

Pristojni organ za ŽGV v Sloveniji je Ministrstvo za kmetijstvo, gozdarstvo in prehrano. Strokovno in raziskovalno delo, svetovanje in razvoj podeželja, gospodarjenje z živalskimi genskimi viri ter izobraževanje, povezano z ŽGV, vodijo v Sloveniji te ustanove:

- Univerza v Ljubljani, Biotehniška fakulteta, Oddelek za zootehniko,
- Univerza v Ljubljani, Biotehniška fakulteta, Oddelek za zootehniko, Center za strokovno delo,
- Univerza v Ljubljani, Veterinarska fakulteta,
- Univerza v Mariboru, Fakulteta za kmetijstvo,
- Kmetijski inštitut Slovenije,
- kmetijske in živilske šole v Sloveniji,
- Kmetijsko-gozdarska zbornica Slovenije,
- območni kmetijsko-gozdarski zavodi (7).

Organizacijsko povezujejo delo rejcev in ustanov rejske organizacije po posameznih vrstah domačih živali.

Delo in sodelovanje je med ustanovami načeloma usklajeno. Ovira je sorazmerno velika razdrobljenost dela in pogosto prevelika specializacija posameznih ustanov na določeno vrsto oz. pasmo domačih živali.

ASSESSMENT OF NATIONAL CAPACITIES

3.1

Institutional and organizational structure of individual AnGR-related activities

The Ministry of Agriculture, Forestry and Food is the competent authority for the field of AnGR. Professional and research activities, advisory services, development of rural areas, management of animal genetic resources, and AnGR-related education in Slovenia is supervised by the following institutions:

- University of Ljubljana, Biotechnical Faculty, Zootechnical Department,
- University of Ljubljana, Biotechnical Faculty, Zootechnical Department, Centre for Expert Work,
- University of Ljubljana, Veterinary Faculty,
- University of Maribor, Faculty of Agriculture,
- Agricultural Institute of Slovenia,
- Agricultural and food science schools in Slovenia,
- Chamber of Agriculture and Forestry of Slovenia,
- Regional agricultural and forestry institutes (7).

Breeders' organizations link together activities of breeders and institutions by individual species of domestic animals.

Activities and cooperation among the institutions are, in principle, coordinated. A relatively high fragmentation of activities and, frequently, too intense a specialization of the institutions in a particular species or breed can constitute an obstacle.

3.2

AnGR INFRASTRUCTURE IN SLOVENIA

In Slovenia the respective species of animal genetic resources utilize the following infrastructure:

3.2.1

Cattle

Test stations for performance and progeny testing for growth-rate and body composition are located in Logatec, Murska Sobota, Nova Gorica, and Rogoza (four different locations). We test the following breeds: Slovenian Brown, Simmental, Black and White, Charolais, Limousin. The total capacity is 470 places for progeny testing in individual pens and 195 places in group pens for performance testing. There are also the required quarantine capacities at the stations. Forty individual box places are in use for testing reproductive performance. Bulls for insemination are located in Preska - 59 places (Slovenian Brown, Black and White, Charolais, Limousin and Belgian Blue bulls), Ptuj - 62 places (Simmental bulls), and Murska Sobota - 28 places (Simmental bulls) (three different locations). Insemination centres at Preska, Ptuj and Murska Sobota store frozen semen of some 560 bulls of different breeds. This constitutes a genetic and strategic reserve.

The tasks of the reference laboratory for analysis of milk samples according to ICAR rules are carried out by the laboratory of the Institute of Dairying at the Zootechnical Department of the Biotechnical Faculty of the University of Ljubljana. In Slovenia there are six laboratories employed for the needs of production-control and dairies (analyses of commercial samples).

3.2.2

Sheep and goats

The test station of the Ljubljana University for the performance testing of rams, with a capacity of 290 places in group pens is located at the Educational Research Unit Logatec. The following breeds are involved in the control: Jezersko-Solcava sheep, Istrian Pramenka, Bela Krajina Pramenka, Bovec sheep, and Texel. Jezersko-Solcava sheep are also examined at the test station in Jezersko, which is owned by the breeders' organization of sheep of the Jezersko-Solcava breed. Sheep insemination is at the moment still in evolution, however, in goats it is already conducted in nucleus herds.

INFRASTRUKTURA ZA ŽGV V SLOVENIJI

V Sloveniji je na voljo in se po posameznih vrstah živalskih genskih virov uporablja ta infrastruktura:

Govedo

Testne postaje za progeni in neposredni test bikov na rast in sestavo telesa ter vzrejališča bikov so na štirih krajih (Logatec, Murska Sobota, Nova Gorica, Rogoza). Preskušamo pasme: slovenska rjava, lisasta, črno-bela, šarole in limuzin. Skupna zmogljivost je 470 stojijoč za progeni test in 195 stojijoč za test lastne proizvodnosti v skupinskih boksih ter potrebne zmogljivosti za karanteno. Za test reprodukcijskih sposobnosti je namenjenih 40 individualnih stojijoč. Biki za osemenjevanje so na treh osemenjevalnih centrih: Preska - 59 stojijoč (biki pasem: slovenska rjava, črno-bela, šarole, limuzin, belgijska belop lava), Ptuj - 62 stojijoč (biki lisaste pasme) in Murska Sobota - 28 stojijoč (biki lisaste pasme). Na osemenjevalnih centrih Preska, Ptuj in Murska Sobota imajo v zalogi zamrznjeno seme pribl. 560 bikov različnih pasem, kar pomeni genetsko in strateško rezervo.

Delo referenčnega laboratorija za analizo vzorcev mleka po pravilih ICAR opravlja laboratorij Mlekarskega inštituta na Oddelku za zootehniko Biotehniške fakultete Univerze v Ljubljani. V Sloveniji deluje za nadzor nad produktivnostjo in potrebe mlekarn (analize komercialnih vzorcev) 6 mlekarskih laboratorijev.

Ovce in koze

Testna postaja Univerze v Ljubljani za test lastne proizvodnosti ovnov na rast z zmogljivostjo 290 stojijoč v skupinskih boksih je na pedagoško-raziskovalnem centru Logatec. V preizkus so vključene pasme: jezersko-solčavska, oplemenjena jezersko-solčavska, istrska pramenka, belokranjska pramenka, bovška in texel. Jezersko-solčavsko pasmo preizkušamo še na testni postaji na Jezerskem, ki je v lasti Društva rejcev ovc jezersko-solčavske pasme. Osemenjevanje ovc je v razvojni fazni, pri kozah pa je uveljavljeno v nukleus čredah.

Konji

Kobilarna Lipica je bila ustanovljena leta 1580 in je seleksijski center ter center genske banke za slovensko avtohtono pasmo lipicanski konj. Od druge infrastrukture sta pomembnejša še Vzrejališče za plemenske žrebce Briga v Kočevski Reki s 60 stojišči in Konjerejski center Krumperk kot pedagoško-raziskovalna enota Univerze v Ljubljani.

Prašiči

Testne postaje za test lastne proizvodnosti prašičev na rast in sestavo telesa pasem švedska landras, nemška landras, large white, duroc in pietrain so na farmah Ihan, Nemščak, Ptuj in Podgrad. Skupna zmogljivost je 1290 individualnih stojišč. Osemenjevalni centri zaprtega tipa za osemenjevanje svinj so na osmih farmah (Ihan, Nemščak, Krško, Stična, Ptuj, Ljutomer, Kočevje, Pograd). Dva osemenjevalna centra odprtrega tipa za osemenjevanje svinj na kmetijah sta na kmetijsko-gozdarskem zavodu v Murski Soboti in na Ptuju (skupaj 55 stojišč).

Perutnina

Pedagoško-raziskovalni center za perutninarnstvo na Oddelku za zootehniko Biotehniške fakultete Univerze v Ljubljani vodi slovensko selekcijo lahkih in težkih linij kokoši prelux ter rejo slovenske avtohtone pasme štajerska kokoš. Center ima celotno infrastrukturo za izvajanje posameznih rejskih opravil. Teste s področja prehrane perutnine opravljajo na testni postaji za perutnino na Fakulteti za kmetijstvo Univerze v Mariboru.

Kunci

Na Centru za kuncerejo Oddelka za zootehniko Biotehniške fakultete Univerze v Ljubljani vodijo rejo in selekcijo očetovske linije SIKA za komercialno prirejo kunčjega mesa. Selekcija materinske linije SIKA poteka neposredno pri rejcih. Center je opremljen tudi za opravljanje krmilnih, prebavljivostnih in metabolnih poskusov na kuncih, pa tudi poskusnih prehranskih in tehnoloških študij.

Horses

3.2.3

The Lipica stud farm was established in 1580. This is now the Slovenian selection centre, and also the gene-bank centre for the Slovenian autochthonous breed of Lipizzan horse. Other important establishments are the Briga Raising Centre for Stallions in Kočevska Reka with 60 places and Krumperk Horse-breeding Centre as an educational and research unit for horse production of the University of Ljubljana.

Pigs

3.2.4

Test stations for performance testing of growth rate and body composition of the breeds of Swedish landrace, German landrace, Large White, Duroc, and Pietrain are located at the following large-scale farms: Ihan, Nemščak, Ptuj and Podgrad. There is a total capacity of 1,290 individual places. Insemination centres, of a closed type, for insemination of sows on farms are located at eight large farms (Ihan, Nemščak, Krško, Stična, Ptuj, Ljutomer, Kočevje, Podgrad). Two insemination centres of an open type for insemination of sows on small private farms are located at the regional agricultural and forestry institutes of Murska Sobota and Ptuj (altogether 55 places).

Poultry

3.2.5

The Educational Research Centre for Poultry at the Zootechnical Department of the Biotechnical Faculty of the University of Ljubljana is in charge of the Slovenian selection of egg and meat production lines of Prelux chickens and breeding of the Slovenian autochthonous breed Styrian hen. The centre is equipped with all the necessary infrastructure to carry out individual breeding activities. Tests of poultry nutrition are conducted at the poultry test station of the Faculty of Agriculture of the University of Maribor.

Rabbits

3.2.6

Selection and breeding of the paternal SIKA line for market production of rabbit meat is conducted at the Rabbit Centre at the Zootechnical Department of the Biotechnical Faculty of the University of Ljubljana. Selection of the maternal SIKA line is carried out directly by breeders. The centre is equipped to conduct feeding, digestion and metabolism experiments with rabbits, and also pilot nutritional and technological studies.

3.2.7

Honey bees

The Agricultural Institute of Slovenia maintains three research beehouses in order to perform selection and thus preserve the biodiversity of the Carniolan honey bee. Queens are bred by registered breeders and contract bee-keepers. Control of the genetic diversity of bees is performed by means of a bee wing morphometry, and with the aid of genetic analyses. The breeding goal of increased honey yields, gentle bee and reduced swarming behaviour is carried out by the selection of bees within the registered bee-queen breeding points. There are 50 monitoring stations in Slovenia for honeyflow forecasting, and also equipment for the identification of the botanical origin of honey.

3.2.8

Fish

The Centre for Aquaculture at the Zootechnical Department of the Biotechnical Faculty of the University of Ljubljana is in possession of infrastructure for the selection of Californian trout. It is possible to incubate and rear 400 fish groups separately. The centre also possesses equipment for marking fish with nitrogen marking and PIT (passive integrated transponders) badges. We possess equipment for the production of populations of a single gender and populations of triploid fish. The equipment permits the assessment of BV for growth-rate of some 50,000 fish in each generation, on the basis of proper phenotypic value and mean phenotypic value of siblings.

The Breeding Centre for Marble Trout at Tolmin Angling Club comprises Modrej hatchery and Tolminka fish farm. The hatchery carries out hatching of eggs and rearing of half-year old juvenile Marble Trout. The hatching capacity is half a million eggs. The capacity of rearing of half-year old juvenile marble trout is 200,000. The rearing technology utilized tries as far as possible to maintain the original properties of the Marble Trout.

3.2.9

Experimental abattoir

The Zootechnical Department of the Biotechnical Faculty of the University of Ljubljana is equipped with an experimental abattoir where it is possible to slaughter chickens, rabbits, sheep, goats, pigs and calves. Analyses of carcass traits and meat properties of all species of farm animals can be performed. In the laboratories it is possible to perform analyses of chemical, physical and sensorical properties of meat as well as analysis of the fatty-acid composition of fats. The principal aim is to explore and improve the properties of animals reared for meat.

Čebele

Za selekcijo in ohranjanje biološke raznolikosti kranjske čebele v Sloveniji imajo na Kmetijskem inštitutu Slovenije tri raziskovalne čebelnjake. Matice vzrejajo registrirani vzrejevalci in pogodbeni čebelarji. Genetsko raznolikost čebel nadzirajo s pomočjo morfoloških analiz čebeljih kril in tudi že s pomočjo genetskih analiz. Rejski cilj "več medu s prijaznejšo in nerojivo čebelo" uveljavlja s selekcijo čebel znotraj registriranih vzrejališč matic. V Sloveniji je 50 opazovalnih postaj za napoved medenja in oprema za ugotavljanje izvora (porekla) medu.

Ribe

Center za akvakulturo na Oddelku za zootehniko Biotehniške fakultete Univerze v Ljubljani razpolaga z infrastrukturo za selekcijo kalifornijskih postrvi. Na centru je mogoče ločeno inkubirati in vzrejati 400 skupin rib. Center ima tudi opremo za označevanje rib s hladnim ožigom in značkami PIT (passive integrated transponders). Na centru je na voljo tudi oprema za vzrejo populacij enega samega spola in populacij triploidnih rib. Infrastruktura omogoča, da se na podlagi lastne fenotipske vrednosti ter srednje fenotipske vrednosti bratov in sester v vsaki generaciji oceni PV za hitrost rasti približno 50 000 ribam.

Vzrejni center za soško postrv pri Ribiški družini Tolmin sestavlja vališče Modrej in ribogojnica Tolminka. V vališču se ukvarjajo z valjenjem iker in vzrejo polletnih mladič. Zmogljivost valjenja je pol milijona iker, zmogljivost vzreje polletnih mladič pa 200 tisoč mladič. Z uporabljeno tehnologijo vzreje poizkušajo čim bolj ohraniti prvobitne lastnosti soške postrvi.

Poskusna klavnica

Na Oddelku za zootehniko Biotehniške fakultete Univerze v Ljubljani imajo poskusno klavnico z razsekovalnico. V poskusni klavnici je mogoče klati piščance, kunce, ovce, koze, prašiče in teleta. V razsekovalnici pa je mogoča analiza klavnih lastnosti vseh vrst domačih živali. V laboratorijsih lahko opravljajo analize kemičnih, fizikalnih in senzoričnih lastnosti mesa in maščobnokislinske sestave maščob. Glavni namen je proučevanje in izboljševanje lastnosti živali, ki jih redimo za meso.

V okviru progenega testa bikov slovenske rjave in lisa-ste pasme potekata razsek klavnih polovic ter spremlja-nje klavne kakovosti (delež posameznih kosov in tkiv) in kakovosti mesa (pH, barva). V klavnici poteka tudi zakol živali iz različnih poizkusov za ovrednotenje klavne kakovosti in kakovosti mesa. Opravljajo testne meritve in disekcije klavnih polovic za potrebe standar-dov za komercialno ocenjevanje mesnatosti klavnih polovic. V sklopu tega proučujemo lastnosti različnih pasem, linij in križancev ter vpliv različnih načinov reje na gospodarsko pomembne klavne lastnosti in lastnosti mesa.

Osemenjevanje in presajanje zarodkov

Na Kliniki za reprodukcijo in konje Veterinarske fakultete Univerze v Ljubljani ter na Enoti za reprodukcijo in genetiko na Nacionalnem veterinarskem inštitutu so laboratoriji in drugi pomožni prostori za raziskovalno in strokovno delo, povezano z osemenjevanjem in pre-sajanjem zarodkov pri domačih živalih. Med opremo je tudi mobilni laboratorij za odvzem in obdelavo semena na terenu.

Služba za identifikacijo in registracijo živali

Na MKGP je organizirana služba za identifikacijo in registracijo živali. Naloga službe je vodenje označevanja in registracije ter spremljanje prometa z živalmi na območju Republike Slovenije v skladu z določili pravnega reda EU. Urejena sta označevanje in regis-tracija goved, v pripravi pa je še za prasiče in drobnico. Vsa kmetijska gospodarstva, ki uveljavljajo ukrepe kmetijske politike, imajo identifikacijsko številko gospodarstva (KMG-MID).



Within the context of progeny testing of Slovenian Brown and Simmental bulls, we perform dissection of carcasses, determine slaughter quality (share of individual parts and tissues) and meat quality (pH, color). Animals from different experiments are also slaughtered to evaluate slaughter and meat quality. Several test measurements and dissections of carcasses are also performed for the requirements of standards for commercial/market evaluation of carcass meatiness. We investigate within this the properties of different breeds, lines and cross-breeds, and the effects of different rearing conditions on economically important carcass traits and meat properties.

Insemination and embryo transfer

3.2.10

At the clinic for reproduction and horses at the Veterinary Faculty of the University of Ljubljana and the unit for reproduction and genetics at the National Veterinary Institute, there are laboratories and other auxiliary facilities for research and professional work in the field of insemination and embryo transfer in domestic animals. The equipment also includes a mobile laboratory for collecting and processing semen in the field.

Service for identification and registration of animals

3.2.11

The identification and registration service (SIR) of ani-mals is a component of the MAFF. The principal task of the service is to control marking and registration, and monitor animal trade in the RS in accordance with EU regulations. Marking and registration has already been put into effect for cattle. It is now under prepara-tion for pigs and small ruminants. All agricultural units (farms) that carry out measures of agricultural policy are equipped with an identification number of the particular unit (FIN).



3.3 HUMAN RESOURCES INVOLVED IN MANAGEMENT OF AnGR, FUTURE REQUIREMENTS, TRAINING AND EDUCATION OPPORTUNITIES

All areas involved in AnGR maintain a skilled and sufficiently educated workforce. Heads and individual associates of the branches of particular animal species, molecular-genetics laboratories, and animal husbandry information systems, laboratories for prediction of BV and gene banks of Slovenian autochthonous breeds of domestic animals have normally attained a Ph.D. degree. They are as a rule involved in international scientific cooperation. Immediate management of AnGR is conducted by professionals who have attained at least a university degree in zootechnical or veterinary studies, including a few holders of M.Sc. and Ph.D. degrees. Professional participants in management with AnGR have ample possibilities for training and education at Slovenian universities and also universities abroad. Special attention is given to the training and education of young professionals and experts.

3.3.1

Research equipment and support for research programs

The genetic laboratory of the Zootechnical Department of the Biotechnical Faculty of the University of Ljubljana is directly involved in AnGR-activities. Its main field of engagement is the molecular genetics of domestic animals and model organisms (mouse). To analyse the genome of animals, the laboratory utilizes a classical genetic approach (genetic crossing, mapping) and modern molecular methods (use of molecular markers). The laboratory is in possession of equipment for standard work in molecular biology, ranging from radioisotope techniques to fluorescent (ABI) technology for DNA sequencing and determination of genotypes. At the moment, the following projects are in process: identifying quantitative loci for growth in chickens that have been bred for high and low body weight, analysing genes for fat deposition in mice and pigs, analysing casein gene expression in cattle and horses, and investigating genetic diversity in specific autochthonous populations of fish and horses and red deer.

ČLOVEŠKI VIRI, KI SO VKLJUČENI V GOSPODARJENJE Z ŽGV, POTREBE ZA PRIHODNJI RAZVOJ, MOŽNOSTI ZA USPOSABLJANJE IN IZOBRAŽEVANJE

Za vsa pomembnejša področja ŽGV so na voljo dobro usposobljeni in ustrezno visoko izobraženi strokovnjaki. Vodje in posamezni sodelavci selekcij posameznih vrst domačih živali, molekularnogenetskih laboratorijskih sistemov v živinoreji, laboratorijskih napovedovanjih genetske vrednosti in genske banke slovenskih avtohtonih pasem domačih živali imajo praviloma doktorat znanosti ter so vključeni v mednarodno znanstveno sodelovanje. V neposredno gospodarjenje z ŽGV so vključeni strokovnjaki z univerzitetno zootehniško in veterinarsko izobrazbo. Med njimi je nekaj magistrov in doktorjev znanosti. Vsi zaposleni pri gospodarjenju z ŽGV imajo dobre možnosti za usposabljanje in izobraževanje na domačih in tujih univerzah. Posebna pozornost je namenjena usposabljanju in izobraževanju mladih strokovnjakov.

Raziskovalna oprema in podpora za raziskovalne programe

Na Oddelku za zootehniko Biotehniške fakultete Univerze v Ljubljani je v delo, povezano z živalskimi genskimi viri, neposredno vključen Genetski laboratorij. Njegova glavna dejavnost je na področju molekularne genetike pri domačih živalih in modelnih organizmih (laboratorijske miši). Pri analizi živalskega genoma laboratorij uporablja klasične genetske (genetska križanja, kartiranje) in sodobnejše molekularne pristope (uporaba molekularnih markerjev). Laboratorij ima opremo za standardno delo v molekularni biologiji od radioizotopnih tehnik do fluorescenčne (ABI) tehnologije za sekvenciranje DNA in določanje genotipov. Trenutno potekajo projekti, povezani z identifikacijo kvantitativnih lokusov za rast pri linijah kokoši, selezioniranih na večjo oziroma manjšo telesno maso, analiza genov za nalaganje maščevja pri miših in prašičih, analiza izražanja kape kazeinskega gena pri govedu in konjih, proučujemo

pa tudi genetsko raznolikost pri nekaterih avtohtonih pasmah rib in konj.

Laboratorij za mikoplazmologijo je osredotočen na molekularne študije ptičjih mikoplazem. Pri temeljnih raziskavah je pomembna dejavnost proučevanje molekularne osnove za spremenljivost nekaterih površinskih proteinov pri mikoplazmah. Na uporabnem področju poskušajo razviti metode za diagnostiko okužb z mikoplazmami (serološki testi, testi na podlagi spremenljivosti RNA/DNA). Ena od glavnih dejavnosti imunološkega laboratorija je priprava in uporaba monoklonskih protiteles.

V delo pri živalskih genskih virih so posredno in neposredno vključeni tudi: Laboratorij za mlekarstvo, Mlekarski biotehnološki laboratorij, Laboratorij za biologijo mišičja, Mikrobiološki laboratorij, Biokemijski laboratorij, Biotehnološki laboratorij, Kemijski laboratorij, Laboratorij za *in vitro* prebavljivost ter laboratoriji na drugih ustanovah in posameznih kmetijsko-gozdarskih zavodih.

Sistem izobraževanja in oprema

Izobraževanje in usposabljanje za potrebe ŽGV poteka na osmih kmetijskih šolah - smeri za kmetovalce in kmetijske tehnike, na Univerzi v Ljubljani - smeri dodiplomskega in poddiplomskega študija: zootehnika in veterinarstvo ter na Univerzi v Mariboru - študij kmetijstva. Študij zootehnike je organiziran na Oddelku za zootehniko Biotehniške fakultete Univerze v Ljubljani na dodiplomski stopnji kot visokošolski strokovni in univerzitetni program ter na poddiplomski stopnji kot specjalistični, magistrski in doktorski program. Na Fakulteti za kmetijstvo Univerze v Mariboru poteka dodiplomski visokošolski strokovni študij zootehnike. Vse šolske ustanove imajo dobro osnovno opremo za teoretični pouk, potrebne laboratorije in šolska posestva ali posebne pedagoško-raziskovalne enote za praktični pouk. Učitelji so dobro usposobljeni in ustrezno izobraženi.

Informacijski sistemi in komunikacijski pripomočki

Informacijski sistemi za ŽGV v Sloveniji so ločeni po vrstah in razviti za govedo, prašiče, ovce in koze. Za druge vrste domačih živali so informacijski sistemi zasnovani. Vzpostavljeni so komunikacijske povezave med izvajalci rejskih programov in mednarodnimi centri. Nastaja enoten informacijski sistem za ŽGV.

The mycoplasmology laboratory is focused on molecular studies of avian mycoplasmas. Investigating the molecular basis for variable expression of some surface proteins in mycoplasmas is an important activity in the field of basic research. In the field of applied research, the laboratory is trying to advance methods for diagnostics of infections with mycoplasmas (serological tests, immunodiagnosis, and diagnostics on the basis of RNA/DNA variability). One of the principal activities of the immunological laboratory is the preparation and application of monoclonal antibodies.

The following institutions are also involved, directly or indirectly, in AnGR-related activities: Institute of Dairying, biotechnological dairy laboratory, laboratory of muscle biology, microbiological laboratory, biochemical laboratory, biotechnological laboratory, chemical laboratory, laboratory for *in-vitro* digestibility. Laboratories of other institutions and specific agriculture-or-forestry establishments are also engaged.

The system of education and equipment

3.3.2

Education and training for the requirements of AnGR is organized at eight agricultural schools - specializations of farmers and agricultural technicians, at the University of Ljubljana - graduate and postgraduate studies: both zootechnical and veterinary studies, and at the University of Maribor - (general) agricultural studies. Zootechnical studies are organized at the Zootechnical Department of the Biotechnical Faculty of the University of Ljubljana at the graduate level (as higher professional studies, and university studies), and the postgraduate level as specialist, master of science and doctoral programs. The Faculty of Agriculture of the University of Maribor conducts higher professional studies in zootechnology. All of the above schools possess all the essential equipment for theoretical courses, the necessary laboratories, and training farms or special educational and research field units. Teachers and instructors are properly educated and fully skilled.

Information systems and apparatus for communication

3.3.3

AnGR information systems in Slovenia have been managed separately with regard particular species and have been developed for cattle, pigs, sheep, and goats. They are now in progress for other species. Communications between breeding program participants and international centres have been established. A uniform AnGR information system is in preparation.

3.4 LEGISLATION AND RULES WITH APPLICATION TO AnGR MANAGEMENT

Slovenian legislation related to AnGR management is regulated in accordance with the *acquis communautaire*. The basic legislative regulations are provided in acts and implementing regulations.

The most important AnGR management-related acts are the following:

- The Agriculture Act is the principal act governing the field of agriculture. It defines the objectives of agricultural policy, planning of agricultural and rural development, and agricultural policy measures;
- The Animal Protection Act defines the rules for welfare of animals, and requirements that have to be ensured in rearing and transport of animals;
- The Veterinary Act regulates precautionary measures in animal health and the minimum scope of health protection of animals;
- The Livestock Breeding Act regulates conservation of genetic variability and genetic reserves of farm animals, autochthonous breeds, animal husbandry gene banks, educational and research work, and application of information systems in the field of animal husbandry.

The Livestock Breeding Act is the principal act regulating management of AnGR and all fields of animal husbandry. It was adopted on 12 February 2002. In Chapter VI (Conservation of genetic variability and genetic reserves of farm animals) it officially regulates biodiversity in the field of animal husbandry. It states:

“The Republic of Slovenia shall ensure and maintain genetic reserves for individual species, breeds and lines of farm animals in the form of a minimum number of farm animals, doses of semen, ova or embryos. For the purpose of conservation of breeds and/or lines, and in order to ensure sufficient production of animal products, breeding programmes shall ensure the genetic variability of farm animals. The funds for the purposes of this Article shall be provided from the budget of the Republic of Slovenia.”

Slovenia has ratified conventions related to conservation of AnGR (e.g., Convention on biological diversity).

ZAKONODAJA IN PRAVILA, POVEZANA Z GOSPODARJENJEM ŽGV

V Sloveniji je zakonodaja, ki je povezana z gospodarjenjem z ŽGV, urejena po vzoru pravnega reda Evropske unije. Temeljna zakonska pravila so v zakonih in njihovih podzakonskih aktih.

Najpomembnejši zakoni, ki se nanašajo na gospodarjenje z živalskimi genskimi viri, so:

- Zakon o kmetijstvu je osnovni zakon na področju kmetijstva, ki med drugim določa cilje kmetijske politike, načrtovanje razvoja kmetijstva in podeželja ter ukrepe kmetijske politike;
- Zakon o zaščiti živali med drugim določa pravila za dobro ravnanje z živalmi, pogoje, ki jih je treba zagotoviti pri reji in prevozu živali;
- Zakon o veterinarstvu med drugim ureja zdravstveno preventivo živali in najmanjši obseg zdravstvenega varstva živali;
- Zakon o živinoreji med drugim ureja ohranjanje genetske variabilnosti in genetske rezerve domačih živali, avtohtone pasme, genske banke v živinoreji, izobraževalno in raziskovalno delo ter uporabo informacijskih sistemov v živinoreji.

Zakon o živinoreji, ki je bil sprejet 12. 2. 2002 in celostno ureja živinorejo v Sloveniji, je temeljni zakon za gospodarjenje z ŽGV. V poglavju »Ohranjanje genetske variabilnosti in genetske rezerve domačih živali«, v katerem se zakonsko ureja biotska raznovrstnost v živinoreji, je med drugim določeno:

“Republika Slovenija zagotavlja in vzdržuje genetske rezerve za posamezne vrste, pasme in linije domačih živali v obliki minimalnega števila domačih živali, doz živalskega semena, jajčnih celic ali zarodkov. Rejski programi morajo zaradi ohranjanja pasem in linij ter zagotavljanja zadostne pritege živalskih proizvodov zagotavljati genetsko variabilnost domačih živali. Sredstva za te namene se zagotovijo iz proračuna Republike Slovenije.”

Slovenija je ratificirala konvencije, povezane z ohranjanjem ŽGV (npr.: Konvencija o biološki raznovrstnosti).

Mednarodne pogodbe, vključno s tržnimi pogodbami, pomembnimi za gospodarjenje z ŽGV

Slovenija je članica evropskih ter svetovnih združenj na področju ŽGV: EAAP, ICAR, SAVE, FAO (komisija CGRFA), DAGENE in druge. Sodeluje z mednarodnimi pasenskimi organizacijami in zvezami pri vseh vrstah domačih živali.

Sodelovanja z drugimi državami in ustanovami; neposredna vključitev tujih/ mednarodnih družb v priejo in razvoj ŽGV

V Sloveniji perutninarstvo oskrbujejo s plemenskim materialom tuje mednarodne družbe in tako neposredno vplivajo na priejo perutninskih proizvodov. Na področju ŽGV Slovenija dobro sodeluje z državami EU ter srednje - in vzhodnoevropskimi državami in številnimi tujimi ustanovami. Tuja rejska združenja in seleksijske družbe dobavljajo tudi plemenski material za osveževanje pasem in rejskih programov (predvsem paternalne linije ali pasme) v Sloveniji.

International agreements, including trade agreements with regard to AnGR- management

Slovenia is a member of European and world associations in the field of AnGR: EAAP, ICAR, SAVE, FAO (Commission CGRFA), DAGENE, and others. It cooperates with international breeders' organizations and unions in all species of farm animals.

Cooperation with other countries, institutions; direct involvement of foreign/ international societies in production and development of AnGR

In the field of poultry production Slovenia has been supplied with breeding materials by international companies. This has had a direct effect on the production of poultry commodities. Slovenia collaborates successfully with EU and CEEC countries and institutions in the field of AnGR. Foreign breeders' associations and breeding companies deliver breeding materials for revitalisation of specific breeds and breeding programs (esp. paternal lines or breeds) in Slovenia.



3.4.1

3.4.2

PREGLED NACIONALNIH PREDNOSTNIH NALOG PRI OHRANJANJU IN UPORABI ŽGV



IDENTIFYING NATIONAL PRIORITIES FOR THE CONSERVATION AND UTILIZATION OF AnGR

Nacionalne prednostne naloge pri ohranjanju in uporabi živalskih genskih virov v Sloveniji so številne in v nadaljevanju so predstavljene samo najpomembnejše.

USTAVITEV ZARAŠČANJA KMETIJSKIH POVRSIN

Opuščanje rabe kmetijskih površin in posledično zaraščanje sta med najbolj perečimi razvojnimi vprašanji države Slovenije. Skupaj s spremenjanjem podnebnih razmer to tudi najbolj vpliva na samooskrbo z živalskimi proizvodi. Država bo morala še bolje poskrbeti za preživetje kmetij, tudi majhnih, in spodbujati mlade gospodarje, da bi se na kmetijah izboljšali izobrazbena in starostna sestava

STRATEGIJA TRAJNOSTNE OSKRBE S HRANO

V Sloveniji ni težav z oskrbo s hrano v kvantitativnem smislu, je pa ta zagotovljena na globalni način, saj skoraj trideset odstotkov hrane dokupimo od drugod. Država bi morala imeti dolgoročno strategijo oskrbe s hrano, v kateri bi bili zapisani ukrepi za:

- ohranjanje lastnih virov za pridelavo in pritejo hrane,
- zdravo in varno hrano,
- pridelavo in pritejo funkcionalne hrane,
- rabo sonaravnih rastlinskih in živalskih pridelkov,
- izboljšanje prehranskih navad,
- izboljšanje in varovanje zdravja prebivalcev in druge.

National priorities in conservation and utilization of AnGR in Slovenia are numerous, with the following being the most important:

PREVENTING OVERGROWING OF AGRICULTURAL LAND

Overgrowing of agricultural lands is a consequence of abandonment of land cultivation. This is an important problem in the development of Slovenia. Along with climatic changes, this can have a significant impact on self-supply of animal products. The Government will have to provide better for the survival of farms, also smallholder and subsistence farms, in order to achieve a better educational and age structure in farms. Young farm holders will need to receive special economic encouragement to stay on farms and to achieve better education.

STRATEGY OF SUSTAINABLE FOOD SUPPLY

Slovenia has no problems supplying a sufficient amount of food for its inhabitants. However, almost thirty percent of our food is obtained from sources outside Slovenia. Our country needs a strategy of sustainable food supply. The strategy should contain the following measures:

- proper maintenance of own resources for food production and processing,
- healthy and safe food,
- production of functional food,
- utilization of sustainable products of plant and animal origin,
- improvement of dietary habits,
- improvement and protection of the health of the population and other.

4.3

ENVIRONMENT- AND ANIMAL-FRIENDLY REARING TECHNOLOGIES

Rearing of farm animals should be directed according to sustainable principles in the sense of preserving nature, reducing negative environmental impact, and accommodating ethological needs of all species of farm animals. A right to undisturbed rearing (right to farm) should be ensured, along with maintaining subsistent or self-sufficient food production and other functions of AnGR (conservation of the cultivated landscape). Low input production systems are here of special importance.

4.4

CONSERVATION OF FARM ANIMALS BIODIVERSITY

The priority of the Government is to persist in the policy of conservation of farm animal's biodiversity that has been successful for the last twenty years. The existing procedures of conservation that are carried out *in situ* should be enhanced with other types of management: *ex situ* methods, genetic and strategic reserves, and others. Creating new animal genetic resources also needs to be encouraged, e.g. selection of new breeds, synthetic populations, lines, etc.

An agreement needs to be reached globally in order professionally to define and outline breeds, formulate uniform procedures for assessment of the degree of risk to a breed, minimum criteria for monitoring breeds, the professional and economic concept of gene banks in animal husbandry, and to seek strategies and programs for conservation of AnGR on both global and local levels. The strategy in relation to genetically modified organisms also needs to be defined more thoroughly.

OKOLJU IN ŽIVALIM PRIJAZNE TEHNOLOGIJE REJE

Rejo domačih živali je treba usmerjati po trajnostnih načelih v smislu ohranjanja narave, zmanjševanja negativnih okoljskih vplivov in upoštevanja etoloških potreb posameznih vrst domačih živali. Zagotovljena morata biti nemotena reja (pravica do kmetovanja) in ohranjanje domače prireje v povezavi s prirejo lastne hrane živalskega izvora in drugimi funkcijami ŽGV (kulturna krajina). Pri tem so posebej pomembni sistemi prireje z majhnim vložkom.

OHRANJANJE BIOTSKE RAZNOVRSTNOSTI V ŽIVINOREJI

Prednostna naloga države je nadaljevanje ohranjanja biotske raznovrstnosti v živinoreji, ki jo je v zadnjih dvajsetih letih uspelo ohraniti prav z njeno pomočjo. Poleg sedanjih postopkov ohranjanja, ki temelje predvsem na metodi *in situ*, je treba še v večji meri uvesti metode *ex situ*, genetske in strateške rezerve ter druge. Prav tako je treba spodbujati delo pri ustvarjanju novih živalskih genskih virov – selekciji novih pasem, sintetičnih populacij, linij ...

Globalno pa je treba doseči dogovor za strokovne opredelitve in določanje pasem, enotne postopke za izračunavanje ogroženosti pasem, minimalna merila za monitoring pasem, strokovne in gospodarske zaslove genskih bank v živinoreji ter poiskati strategije in programe ohranjanja ŽGV na globalni in lokalni ravni. Odločneje kaže opredeliti tudi strategijo do gensko spremenjenih organizmov.

IZKORIŠČANJE ŽGV - NAMENJANJE VEČJE POZORNOSTI KRITIČNIM PODROČJEM

Za izboljšanje stanja izkoriščanja ŽGV je treba doseči večji vpliv stroke in znanja na področju zootehnikе. Preseči je treba sedanjo razdrobljenost pri strokovnem delu, pa tudi razdrobljenost informacijskih sistemov in uveljaviti enoten informacijski sistem, pri vseh vrstah domačih živali vpeljati sodobne metode za napovedovanje genetske vrednosti in nove metode v selekcijo (monitoring proizvodnosti, nove lastnosti, vključevanje molekularnogenetskih metod in lastnosti, dolgoročno ohranjanje genskega materiala, neposredna dostopnost do podatkov ...).

UTILIZATION OF AnGR - MORE ATTENTION TO BE ACCORDED TO CRITICAL AREAS

4.5

In order to improve the state of utilization of AnGR, more authority will have to be accorded to the animal production profession and knowledge. The existing fragmentation of professional activities and information systems should be overcome so that a uniform information system can be put into effect. In all farm animals, modern methods for predicting breeding value have to be included and new selection methods (monitoring of production, new traits, molecular genetics methods and markers, long-term conservation of genetic materials, direct accessibility of data ...) introduced.

IZVAJANJE NACIONALNE POLITIKE V ŽIVINOREJI

4.6

IMPLEMENTATION OF NATIONAL POLICY IN ANIMAL PRODUCTION

Prednost ima uveljavljanje določil Zakona o živinoreji, še posebej drugega poglavja Reja živali, v katerem so določeni način reje, prostor, zavarovana območja, pravica do reje domačih živali, ekološki in etološki parametri, zbirke podatkov in kakovost živalskih proizvodov, še posebej v smislu funkcionalne hrane. Pomembna je zdrava in varna hrana živalskega izvora. Država mora določiti pomen lastne prireje živalskih proizvodov.

The priority of the policy is to bring into effect the Livestock Breeding Act, especially Chapter II (Rearing of Farm Animals). This chapter outlines the methods of rearing, surface, protected areas, legal rights with regard to rearing of farm animals, ecological and ethological subjects, data bases, and quality of animal products, esp. in the sense of functional food. Healthy and safe food of animal origin plays a special role. The Government needs to define the significance of domestically produced animal products.

POSODOBITEV NACIONALNE INFRASTRUKTURE V ŽIVINOREJI

4.7

MODERNIZATION OF NATIONAL INFRASTRUCTURE IN ANIMAL PRODUCTION

Nacionalno in drugo infrastrukturo v živinoreji je treba posodobiti, preseči njuno razdrobljenost ter poskrbeti za stalno izobraževanje in usposabljanje človeških virov na vseh stopnjah strokovnega in raziskovalnega dela z ŽGV doma in v tujini. Raziskovalno delo na vseh področjih ŽGV je treba povečati in ga vključiti v skupne mednarodne projekte. Treba je oblikovati nacionalne genske banke ŽGV za *ex situ* shranjevanje genskega materiala.

National and other animal production infrastructure needs to be modernized and fragmentation overcome. It is essential to provide continual education and training of human resources on all levels of professional and research work related to AnGR, both at home and abroad. Research activities need to intensify and begin to take part in joint international projects. A national AnGR gene bank for *ex situ* conservation of genetic materials needs to be established.

OBLIKOVANJE PRIPOROČIL ZA MEDNARODNO SODELOVANJE NA PODROČJU BIOTSKE RAZNOVRSTNOSTI DOMAČIH ŽIVALI



FORMULATING RECOMMENDATIONS FOR ENHANCED INTERNATIONAL COOPERATION IN THE FIELD OF FARM ANIMAL BIODIVERSITY

SEDANJE MEDNARODNO SODELOVANJE NA PODROČJU ŽGV

Slovenija na področju ŽGV sodeluje s temi najpomembnejšimi mednarodnimi organizacijami:

EAAP – sodelovanje v delu predsedstva, pri vodenju in delu delovnih skupin ter komisij za govedorejo, konjerejo in prašičerejo in vodenje projekta BABROC. Slovenija in Biotehniška fakulteta Univerze v Ljubljani sta dobili kandidaturo za organizacijo 55. kongresa EAAP, ki bo leta 2004 na Bledu.

DAGENE – mednarodna nevladna organizacija podonavskih držav za ohranjanje biotske raznovrstnosti v živinoreji; v njej smo dejavní člani in člani predsedstva ter organizatorji strokovnih simpozijev.

FAO – neposredno delo v komisiji za genske vire, pomembne za kmetijstvo in prehrano.

SAVE – sodelovanje pri projektih za zaščito kmetijskih genskih virov v Evropi.

ICAR – Slovenija je članica od leta 1986, v letu 1996 pa je pridobila pravico do uporabe suhega žiga *"Quod scriptum est manet."* Slovenija je leta 2000 uspešno organizirala kongres ICAR na Bledu.

INTERBULL (pododbor v okviru ICAR-ja) – skrbi za usklajevanje napovedi PV. Ocene naših bikov redno (4-krat letno) pošiljamo v center INTERBULL na Švedsko, kjer jih primerjajo z rezultati drugih držav (uvrstitvena lestvica za posamezne pasme).

IDF – v tem združenju Slovenija dejavno sodeluje in izmenjuje izsledke s področja prieveje mleka.

APIMONDIA 2003 – organizacija svetovnega čebelarskega kongresa v Sloveniji v letu 2003.

Slovenija je članica evropskih in svetovnih združenj pri posameznih vrstah domačih živalih.

EXISTING INTERNATIONAL COOPERATION IN THE FIELD OF AnGR

5.1

Slovenia maintains the following forms of cooperation in the field of AnGR:

EAAP - participation in the presidency, forming working groups and commissions for cattle, horse and pig production, and the BABROC project. Slovenia and the University of Ljubljana, Zootechnical Department of the Biotechnical Faculty have been selected as the winning candidates for organizing the 55th EAAP Congress in Bled, 2004.

DAGENE - international non-governmental organization of the Danubian countries for conservation of biodiversity in animal husbandry; Slovenia is an active member, member of the presidency, and an organizer of professional symposia.

FAO - active work in the commission on genetic resources for food and agriculture.

SAVE - participation in the SAVE foundation (Safeguard for Agricultural Varieties in Europe).

ICAR - member since 1986; in 1996, Slovenia acquired the right to use the special stamp *"Quod scriptum est manet."* An ICAR congress was successfully organized in 2000 in Bled, Slovenia.

INTERBULL - (an ICAR subcommittee) provides harmonization of the prediction of BV. Assessments of our bulls are sent regularly (4 times per year) to the INTERBULL centre in Sweden and are compared with the results of other countries (rank scale for individual breeds).

IDF - Slovenia actively participates in this association and exchanges results in the field of milk production.

APIMONDIA 2003 - Organization of the World Congress of Apiculture in Slovenia in 2003.

Slovenia is member of the European and World associations of particular breeds of farm animals.

5.1.1

Participation in the European and World information databases on AnGR

Slovenia contributes AnGR data to the following databases: DAD-IS, EAAP - AGDB and OKLAHOMA STATE UNIVERSITY - BREEDS.

Sodelovanje v evropskih in svetovnih zbirkah podatkov o ŽGV

Slovenija ima podatke o ŽGV v teh zbirkah podatkov: DAD-IS, EAAP – AGDB in OKLAHOMA STATE UNIVERSITY – BREEDS.

5.2

INTERNATIONAL RESEARCH PROJECTS AND COOPERATION

The project of the European Union's Fourth Framework Program: Biotechnical methods in the maintenance of genetic diversity of the Lipizzan horse breed (INCO/Copernicus - project).

Biodiversity of mammary gland expressed genes (Project: COST B20 - Mammary gland development function and cancer).

We cooperate with ISAG in carrying out comparative tests. Checking pedigrees, conducted mostly in horses of the Lipizzan breed.

International comparability of set MS markers for sheep - application for a comparative test of laboratories in 2003

International project APIIS (Adaptable Platform Independent Information System - an independent information system adaptable to a computerized environment). The information system APIIS is a project that tries to create an information system adaptable to the environment. It is in use for all kinds of farm animals and covers the needs of national selection programs, insemination centres, animal husbandry households and public services. This information system consists of several modules: fattening, young, milk production, reproduction, semen, identification and registration, growing/meat, farm, base and genetic modules, with programs for prediction of BV and selection. APIIS is being introduced in Slovenia for the following species of farm animals: horses, cattle, pigs, rabbits.

Cooperation with insemination centres in Europe and also outside Europe (especially Italy, Austria, Germany, Switzerland, France, the Netherlands, Denmark, USA, and Canada).

MEDNARODNI RAZISKOVALNI PROJEKTI IN SODELOVANJE

Projekt 4. okvirnega programa za EU: Biotechnical methods in the maintenance of genetic diversity of the Lipizzan horse breed (INCO/Copernicus - project).

Biodiversity of mammary gland expressed genes (Project: COST B20 - Mammary gland development function and cancer).

Za izvajanje primerjalnih testov sodelujemo z ISAG. Poreklo preverjamo predvsem pri konjih lipicanske pasme.

Mednarodna primerljivost set MS markerjev za ovce – prijava za primerjalni test laboratorijev v letu 2003.

Mednarodni projekt APIIS (Adaptable Platform Independent Information System/Računalniškemu okolju prilagodljiv neodvisen informacijski sistem). Informacijski sistem APIIS je projekt, ki poskuša narediti okolju prilagodljiv informacijski sistem. Uporabljam ga za vse vrste domačih živali in zadovoljuje potrebe nacionalnih selekcijskih programov, osemenjevalnih centrov, živinorejskih obratov in javnih služb. Informacijski sistem je sestavljen iz več modulov: fattening, young, milk production, reproduction, semen, identification, growing/meat, farm, base in genetskega modula s programi za napovedovanje PV in odbiro. V Sloveniji se je začelo vključevanje v APIIS pri teh vrstah domačih živali: konjih, govedu, prašičih in kuncih.

Sodelovanje z osemenjevalni centri v Evropi in svetu (predvsem Italija, Avstrija, Nemčija, Švica, Francija, Nizozemska, Danska, ZDA, Kanada).

KAJ LAHKO SLOVENIJA PONUDI DRUGIM DRŽAVAM NA PODROČJU ŽGV?

Slovenija razpolaga na področju ŽGV z raziskovalnimi zmogljivostmi, tehnologijami, strokovnjaki, raziskovalci ter znanjem in izkušnjami, ki jih lahko ponudi drugim državam, in sicer:

- selekcijske in rejske programe po posameznih vrstah ŽGV,
- informacijske sisteme,
- postopke za napovedovanje genetske vrednosti,
- tehnologije ohranjanja ogroženih ŽGV po metodah *in situ*,
- molekularnobiološke metode za ŽGV,
- zakonsko ureditev za ohranjanje ŽGV,
- dodiplomsko in poddiplomsko izobraževanje na vseh področjih ŽGV,
- strokovne in znanstvene delavnice po posameznih področjih ŽGV,
- plemenski material (žive živali, seme, zarodki) po posameznih vrst domačih živali.

WHAT CAN SLOVENIA OFFER TO OTHER COUNTRIES IN THE FIELD OF AnGR?

5.3

In the field of AnGR, Slovenia is in possession of research facilities, technologies, a professional and research workforce, knowledge and experience. The following can be offered to other countries:

- selection and breeding programs for all specific AnGR species,
- information systems,
- procedures for predicting genetic values,
- technologies for conservation of endangered AnGR according to *in situ* methods,
- AnGR-related molecular-biology methods,
- legal measures for conservation of AnGR,
- graduate and post-graduate education related to all fields of AnGR,
- organisation of professional and scientific workshops for all fields of AnGR,
- provision of breeding materials (live animals, semen, embryos) of individual species.

KAJ SLOVENIJA POTREBUJE NA PODROČJU ŽGV?

5.4

Za uspešnejše ohranjanje ŽGV potrebuje Slovenija pomoč pri reorganiziranju rejskega in strokovnega dela v živinoreji. Za posodabljanje nacionalnih zmogljivosti in še posebej za postavitev skupnih zmogljivosti je potrebna finančna pomoč.

WHAT DOES SLOVENIA NEED IN THE FIELD OF AnGR?

To successfully conserve AnGR, Slovenia needs help in the reorganization of rearing and professional activities in animal husbandry. We need subsidies in order to modernize national capacities, and especially to establish common capacities.

POVZETEK



SUMMARY

SLOVENIJA IN NJEN KMETIJSKI SEKTOR

Slovenija je ena najmanjših evropskih držav s skupno površino 20 273 km², od katere je po uradnih statističnih podatkih gozda 56,5 %, kmetijskih površin v uporabi pa le 25,5 %. Z več kot polovico celotnega ozemlja, poraslega z gozdom, spada Slovenija med najbolj gozdнатe države v Evropi. Velik problem predstavlja opuščanje in zaraščanje kmetijskih zemljišč. Njivskih površin je le še dobrih 8 % skupne površine, skoraj 80 % kmetijskih zemljišč v uporabi pa leži na območjih z omejenimi dejavniki za kmetijsko pridelavo. Število prebivalcev je precej nespremenljivo in se že dolgo giblje blizu 2 milijonov, od tega je aktivnih blizu 50 %. Okoli polovica prebivalstva živi na podeželju. Delež prebivalstva, ki živi na kmetijah (v letu 2000 le še 16,2 %), se stalno zmanjšuje in ravno tako delež tistih, katerih glavni vir dohodka izvira iz kmetijstva (v letu 2000 že manj kot 3 %).

Kmetijstvo ima v Sloveniji izrazito večfunkcionalno vlogo. Najpomembnejša panoga je živinoreja, ki prispeva okoli 2/3 celotne vrednosti končne kmetijske proizvodnje, po podatkih nacionalnih računov pa okoli polovico bruto domačega proizvoda kmetijstva. Med živinorejskimi panogami so gospodarsko najpomembnejše govedoreja, prašičereja in perutninarnstvo. Za Slovenijo je značilna izrazito majhna velikostna sestava kmetij. Prevladujejo družinske kmetije, kar še posebno izrazito velja za govedorejo kot najpomembnejšo panogo živinoreje, pa tudi za rejo drobnice. Pereče razvojno vprašanje je izredno nizka splošna in poklicna izobrazba zaposlenih v kmetijstvu, pa tudi njihova starostna sestava. Slovenija je neto uvoznica večine živalskih proizvodov, doma prirejeni proizvodi so zato v veliki meri namenjeni domačemu trgu. Agregatna stopnja samooskrbe se giblje le okoli 80 %, oskrba s hrano pa je zagotovljena globalno.

SLOVENIA AND ITS AGRICULTURAL SECTOR

6.1

Slovenia is one of the smallest European countries and covers a total area of 20,273 km². According to official statistical data, forest and woodlands represent 56.5 % of the surface which makes Slovenia one of the most forested countries in Europe. Overgrowing and abandoning of agricultural land is a serious problem. Utilized agricultural area accounts for only 25.5 %, with only 8 % of the total surface being arable. Almost 80 % of agricultural lands are located in regions with unfavourable conditions for agricultural production. The population of Slovenia has stabilized at some 2 million, with the share of active population at almost 50 %. Half of the population live in rural areas. The number of those who live in agricultural households (only 16.2 % in 2000) is constantly decreasing, as is the number of those whose main source of income comes from agricultural activities (less than 3 % in 2000).

Agriculture in Slovenia has a clearly multi-functional role. The most important sector of agriculture is livestock production, which contributes about two thirds of the final value of agricultural output, and according to national economic accounts it represents about half of the agricultural gross domestic product. Cattle, pig and poultry are the most important livestock sectors. Slovenian agriculture is characterized by a small farm structure. Family farms predominate, which is especially true of cattle production as the most important livestock sector, and also small ruminant production. An important challenge for the future development of agriculture in Slovenia is the very low level of education of those employed in farming, and their age structure. Slovenia is a net importer of many animal products. Slovenian livestock products are intended mainly for domestic consumption. The aggregate level of self-sufficiency in food is about 80 %, so an adequate food supply can be secured only globally.

THE STATE OF GENETIC RESOURCES IN THE FARM ANIMAL SECTOR

6.2.1

Overview of the country's animal production systems in relation to animal biodiversity

Ninety percent of agricultural households rear farm animals, usually more than one species. Half of the households with farm animals keep two species, but also farms with three, four or five species of farm animals can be found frequently. Low and medium input systems are prevalent, especially as regards the number of farms. However, if the number of farm animals on individual farms are considered, an inverse situation in some species can be observed. Namely, a comparatively small numbers of large-scale commercial farms with high input take up an extremely high share in the total animal population (especially in pigs, chickens and turkeys). Most agricultural units are privately owned. Family farms predominate. Exceptionally, there exist large-scale commercial farms with pigs, chickens and turkeys, and to a lesser degree with cattle. These farms are mostly descended from former state agricultural enterprises and now continue as private companies, with the state controlling a share of ownership.

More important products of animal origin are meat (of cattle, pigs, poultry, horses, rabbits, and small ruminants), milk (cow, goat, and sheep) and eggs (poultry esp. chickens). Wool has little economic importance and neither do animal skins. Manure is important with regard to maintaining soil fertility. However, in the short term, manure can even frequently be considered to be an undesired by product, especially in large scale production. The significance of animals and livestock production is growing with regard to conservation of the rural landscape. The role of farm animals in cultural and leisure activities is also growing. Locally adapted breeds differ significantly with regard to a particular species and its importance in production. Sheep production is characterized mostly by autochthonous breeds. Exotic and continually imported breeds have more significance as male lines in cross-breeding. In order to protect the autochthonous Carniolan honey bee the rearing of other bee breeds is not allowed in Slovenia.

OCENA STANJA GENSKIH VIROV V ŽIVINOREJI

Pregled proizvodnih sistemov v živinoreji v povezavi z biotsko raznovrstnostjo

Kar 90 % kmetijskih gospodarstev v Sloveniji redi domače živali, največkrat več vrst: na polovici gospodarstev z živalmi sta zastopani dve vrsti domačih živali, pogosto pa srečamo tudi tri, štiri ali pet vrst. Prevladujejo proizvodni sistemi z majhnim in srednjim vložkom, zlasti pri razvrstitvi na podlagi števila rej. Če upoštevamo stalež živali na posameznih kmetijskih gospodarstvih, pa pri nekaterih vrstah opazimo obrnjen položaj, ko ima razmeroma majhno število sorazmerno velikih rej (na velikih farmah) z velikim vložkom izredno velik delež v celotnem staležu, kar se seveda kaže v prevladi proizvodnih sistemov z velikim vložkom v nacionalni populaciji teh vrst domačih živali (pri prašičih, kokoših in purah). Večina kmetijskih gospodarstev je v zasebni lasti, prevladujejo družinske kmetije. Izjema so le velike kmetije in kmetijska gospodarstva pri prašičih, kokoših in purah, nekaj tudi pri govedu, ki so se razvila iz nekdanjih družbenih podjetij in imajo zdaj status zasebnih družb, njihova lastnina pa je delno še državna.

Med pomembnejše živalske proizvode lahko uvrščamo meso živali (goveje, prašičje, perutninsko, konjsko, kunče, meso drobnice), mleko (kravje, kozje in ovčje) in jajca (perutnina, predvsem kokoši). Volna nima večje gospodarske vrednosti, podobno velja tudi za živalske kože. Gnoj je pomemben predvsem z vidika ohranjanja rodovitnosti tal, s kratkoročnega ekonomskega vidika pa je zlasti pri večjih rejah pogosto celo nezaželen stranski proizvod. Narašča pomen živali in živinoreje za ohranjanje kulturne krajine, torej pri gospodarjenju s prostorom, povečuje pa se tudi vloga živali pri kulturno-rekreacijski dejavnosti. Pomen lokalno prilagojenih pasem v priejih je med vrstami zelo različen. Pri ovčereji poteka večina prieje z domačimi avtohtonimi pasmami. Tujerodne in stalno uvožene pasme pa so pri večini živalskih vrst pomembnejše predvsem kot moške linije pri križanjih. Zaradi varovanja obstoja avtohtone kranjske čebele na območju Republike Slovenije nista dovoljena reja drugih pasem čebel in promet z njihovim plemenskim materialom.

Ocena stanja ohranjanja biotske raznovrstnosti v živinoreji

Pomen biotske raznovrstnosti domačih živali se je v Sloveniji začel povečevati v osemdesetih letih, ko je bila v Evropi ustanovljena banka genetskih podatkov domačih živali. Slovenija se je v delo vključila na samem začetku in sporočila prve podatke o nekaterih avtohtonih slovenskih pasmah domačih živalih, pozneje pa še podatke o drugih pasmah v slovenskem prostoru. V Sloveniji je 49 pasem domačih živali, od katerih je 29 lokalno prilagojenih, 20 pasem je tujerodnih. Ogroženih je 15 lokalno prilagojenih pasem, močneje razširjenih je le 20 pasem (12 lokalno prilagojenih in 8 tujerodnih). Na ravni populacij spremljamo osnovne rejske podatke za 49 pasem, genetske distance pri 5 in ocenjevanja pasem in križanj za 49 pasem. Na individualni ravni merimo in ocenjujemo proizvodne lastnosti pri 35 pasmah, za 21 pasem opravljamo genetska in za 17 pasem molekularna ocenjevanja. Pri pasmah, ki so v reji močneje zastopana, vključujejo rejski programi pri 13 pasmah selekcijo v čisti pasmi ter pri sedmih pasmah selekcijo v čisti pasmi in križanje.

Na območju Republike Slovenije so tudi druge vrste in pasme domačih živali, ki pa so praviloma le občasno prisotne ali pa jih je le po nekaj glav. V ljubitelski reji je 124 pasem (60 pasem perutnine, 3 pasme pur, 11 pasem rac, 7 pasem gosi in 43 pasem kuncev). Od divjih prednikov domačih živali v Sloveniji živila muflon (*Ovis musimon*) in divji prašič (*Sus scrofa*). Uvajanje gospodarsko donosnejših pasem v zadnjih desetletjih je povzročilo, da manj proizvodne slovenske avtohtone pasme izginjajo ali pa so pretopljene z novimi. Tako je v reju domačih živali vključenih vedno manj avtohtonih pasem, zaradi česar smo jih nekaj tudi izgubili (v zadnjih petdesetih letih 6 pasem), od drugih pa so se ohranili le ostanki. Tako smo izgubili del biotske raznovrstnosti pri posameznih vrstah domačih živali. Na zmanjševanje biotske raznovrstnosti v živinoreji močno vpliva izgubljanje kmetijskih zemljišč (zaraščanje, urbanizacija idr.). To nadalje negativno vpliva na stanje agrarnih ekosistemov in pestrost kmetijskih genskih virov. Podatki o statusu pasem so natančnejši za pasme, ki so pomembnejše za prirejo hrane, saj je pri teh pasmah raven rejskega in seleksijskega dela višja.

V skladu z Zakonom o živinoreji sistematično spremjanje in analiziranje (monitoring) stanja biotske raznovrstnosti izvajamo kot javno službo v okviru nalog genske banke v živinoreji. Način izvajanja monitoringa biotske raznovrstnosti v živinoreji predpiše minister. Biotska raznovrstnost v živinoreji je sestavni del Strategije ohranjanja

Assessing the state of conservation of farm animal biodiversity

6.2.2

The biodiversity of farm animals became important in Slovenia in the 80s with the establishment of the relevant gene data bank in Europe. Slovenia began to participate from the beginning, when it contributed the first data on Slovenian autochthonous breeds of farm animals, and later other breeds that are also kept in Slovenia. Currently, 49 breeds of farm animals are reared in Slovenia, of which 29 breeds are locally adapted and 20 are exotic. Fifteen locally adapted breeds are at risk. Twenty breeds (12 locally adapted and 8 exotic) are widely used. Basic breeding data for 49 breeds, genetic distance for 5 and assessment of breeds and crosses for 47 breeds are monitored on the population level. On the individual level, performance recording of 35 breeds, genetic evaluation of 21 and molecular evaluation of 17 breeds are carried out. In widely used breeds, the following breeding strategies are applied: pure-breed selection in 13 breeds, and pure-breed selection and cross-breeding in seven breeds.

Some other species and breeds can also be found in Slovenia. They are present only occasionally or number only a few animals. There are 124 breeds that are kept only by hobby breeders or fanciers (60 breeds of chickens, 3 turkeys, 11 ducks, 7 geese, and 43 breeds of rabbits). Mouflon (*Ovis musimon*) and wild boar (*Sus scrofa*) are the only wild ancestors of Slovenian farm animals. The introduction of more profitable breeds in past decades has brought about a gradual disappearance of less productive Slovenian autochthonous breeds or their blending with newly introduced breeds. Livestock production now involves fewer and fewer autochthonous breeds, and for this reason some breeds have been lost completely (6 breeds have been lost in the last 50 years). Some other breeds still exist but only as the last remnants of them. We have thus lost a part of the biodiversity in some species of farm animals. Biodiversity in animal production has been strongly impacted by increasing reduction and loss of agricultural lands (overgrowing, urbanization of land etc.). All this is affecting rural ecosystems and impacting in a negative sense on the diversity of agricultural genetic resources. Information concerning the status of individual breeds is more accurate for breeds that hold more importance in food production, given the higher level of breeding and selection activities of those breeds.

Systematic monitoring and analysis of the state of biodiversity is conducted, according to the Livestock Breeding Act, as a public service within the context of the gene bank in animal production. The method of monitoring biodiversity in animal production is directed

by the MAFF. Biodiversity in animal production is a constituent of the Biodiversity Conservation Strategy of Slovenia. It was adopted by the Government of the Republic of Slovenia in 2001.

The MAFF has also approved a program of "Conservation of biodiversity in animal production in Slovenia from 2001 to 2008". The Livestock Breeding Act details 18 autochthonous breeds (including 5 breeds of dogs) that are being preserved in the autochthonous environment as an *in situ* gene bank. The program of conservation of biodiversity in animal production in Slovenia in 2001 comprised more than 3200 individual farm animals of all species kept by more than 300 breeders. Inclusion of each animal in the program entails a special contract that binds the owner to fulfil all the required conditions. The owners are then entitled to receive an annual subsidy and may also receive additional support for investment. Slovenia has thus taken the first steps towards systematic *ex situ* conservation of AnGR biodiversity. A program of conservation in the form of frozen semen is performed in Slovenia in cattle.

6.2.3

Assessing the state of utilization of farm AnGR

The management of AnGR in Slovenia is regulated by the Livestock Breeding Act. A smaller part of this field is also regulated by the Agriculture Act. The fields of AnGR management linked to biodiversity conservation by taking into account sustainable use of natural resources in the sense of EU structural policy, are managed by the Slovenian Agro-Environmental Program (SAEP). Both Acts and the accompanying decrees are harmonized with *acquis communautaire*. Around 11 million EUR are assigned annually for recording production traits, selection and reproduction of all species of animals. The Government contributes 70 % of this figure and breeders 30 %.

Farm animal species in Slovenia vary in importance given the specific structure of the land (predominance of grasslands), and the substantial share of lands with unfavourable (limiting) conditions for cultivation. Horses and ruminants are the most important farm animals, especially cattle. Consumers of animal products, and the food industry, indirectly influence the importance and consequently the inventory of a particular species or breed. The importance of exotic breeds (cattle, pigs, and poultry) has been increasing in recent decades because of strong intensification in animal production. In small ruminants and horses, most emphasis in the production of food, and in agriculture in general, has been placed on locally adapted breeds (autochthonous and traditional). The importance of locally adapted breeds is currently

biotske raznovrstnosti v Sloveniji. Sprejela jo je Vlada Republike Slovenije v letu 2001.

Izdelan in sprejet je dolgoročni program Ohranjanja biotske raznovrstnosti v živinoreji v Sloveniji 2001–2008. V Zakonu o živinoreji so navedene avtohtone pasme domačih živali (18 – od tega 5 pasem psov), ki jih ohranjamo v genski banki *in situ* v avtohtonem okolju. V letu 2001 je bilo v program ohranjanja biotske raznovrstnosti v živinoreji vključenih nad 3200 domačih živali različnih vrst in pasem pri več kot tristo rejcih.

Rejci imajo za vsako žival, ki jo želijo vključiti v program ohranjanja, sklenjeno pogodbo, ki jih zavezuje k izpolnjevanju predpisanih pogojev, na podlagi teh pa so upravičeni do izplačila vsakoletne premije in imajo možnost pridobiti investicijsko pomoč. V Sloveniji so narejeni prvi koraki za sistematično ohranjanje biotske raznovrstnosti ŽGV *ex situ*. Program ohranjanja v obliki zamrznjenega semena v Sloveniji izvajamo pri govedu.

Ocena stanja uporabe ŽGV

Z Zakonom o živinoreji je urejena uporaba ŽGV na zakonodajni ravni. Manjši del tega področja ureja tudi Zakon o kmetijstvu. Tista področja uporabe ŽGV, ki so povezana z ohranjanjem biotske raznovrstnosti ob upoštevanju sonaravne rabe naravnih virov v smislu strukturne politike EU, ureja Slovenski kmetijski okoljski program. Oba zakona sta usklajena s pravnim redom EU. Področjem kontrole proizvodnih lastnosti, selekciji in reprodukciji vseh vrst živali je letno namenjenih okoli 11 mil. evrov, od tega je prispevek države 70 % in prispevek rejcev 30 %.

Zaradi specifične strukture kmetijskih zemljišč (prevladujejo travnate površine) in velikega deleža kmetijskih zemljišč s težjimi pridelovalnimi razmerami je specifičen tudi pomen posameznih vrst živali v Sloveniji. Poseben pomen imajo konji in prežvekovalci, najpomembnejše je govedo. Tudi porabniki živalskih proizvodov in živilska industrija posredno vplivajo na večjo ali manjšo razširjenost posamezne vrste in tudi pasme domačih živali. V zadnjih desetletjih je zaradi velike intenzivnosti prieje naraščal pomen tujerodnih pasem domačih živali (govedo, prašiči, perutnina). Pri drobnici in konjih so za priejo hrane in kmetijstvo s širšega vidika najpomembnejše lokalno prilagojene (avtohtone in tradicionalne) pasme. Trenutno pomen lokalno prilagojenih pasem narašča pri govedu, nekoliko manj pa tudi pri prašičih in perutnini. Pri vseh vrstah živali pa se povečuje število živali in pasem, ki se na novo uvažajo v Republiko Slovenijo.

Govedo prispeva skoraj vse mleko (delež mleka drobnice je < 0,5 %) v skupni bilanci prirejenega mleka v Sloveniji. V bilanci prirejenega mesa je najpomembnejša perutnina (39 %), sledijo prasiči s 35-odstotnim in govedo s 25-odstotnim deležem. Vrednostno razmerje med prirejo mleka in mesa pri govedu je 54 : 30, med prirejo mesa in jajc pri perutnini pa 62 : 35. Z vidika ohranjanja kulturne in naravne dediščine pri vseh vrstah živali narašča pomen avtohtonih pasem in tradicionalnih proizvodov. Rejski cilji so določeni in se uresničujejo pri 34 pasmah. Individualno živali označujemo pri 46 pasmah, pri 35 pasmah ocenjujemo proizvodne lastnosti, osemenjevanje uporabljamo pri razmnoževanju 18 pasem, prenos zarodkov pa pri petih pasmah. Genetsko ocenjevanje je vpeljano pri 21 pasmah.

Slovenska zakonodaja ureja večino strokovnih nalog s področja zootehnik. Zakonsko so urejeni vodenje rodovniških knjig, označevanje plemenskih živali, promet s plemenskimi živalmi, selekcija in rodovništvo, kontrola proizvodnje in reprodukcije, prav tako sta posebej urejeni čebelarstvo in ribogojstvo. Urejeni so osemenjevanje domačih živali in načini potrjevanja plemenjakov ter metode testiranja plemenskih živali, označevanje in identifikacija plemenskih živali ter vodenje predpisanih registrov in evidenc. Slovenija je februarja 2002 sprejela Zakon o živinoreji, ki je usklajen s pravnim redom EU in med drugim določa prihodnjo organiziranost, rejske programe, skupne temeljne rejske programe, ohranjanje genetske variabilnosti in genetske rezerve domačih živali. V skladu z določili tega zakona bodo ustavljene priznane rejske organizacije, odobrene organizacije in druge priznane organizacije. S tem zakonom je ustavljen tudi Svet za živinorejo, ki kot svetovalni organ ministra za kmetijstvo usmerja strokovno, gospodarsko in družbeno politiko na področju živalskih genskih virov v Sloveniji.

growing in cattle, and to some extent also in pigs and poultry. However, the number of new imports of animals and breeds to Slovenia is growing in all species.

Cattle supply almost the entire milk production in Slovenia (small ruminants participate with less than 0.5 %). Poultry has the highest share in meat production (39 %) followed by pigs (35 %), and cattle (25 %). The ratio between milk and meat production in cattle is 54:30, and between meat production and egg in poultry is 62:35, respectively. The significance of autochthonous breeds of all species, and also traditional products, is growing, especially as regards the conservation of the cultural and natural heritage. Breeding goals have been defined and implemented in 34 breeds. Individual identification and registration of animals is carried out on 46 breeds, production traits are assessed in 35 breeds, artificial insemination is used in reproduction of 18 breeds, and embryo transfer is conducted in 5 breeds. Genetic evaluation has been implemented in 21 breeds.

Slovenian legislation regulates most professional activities related to animal production. There are acts that regulate herdbooks, identification of breeding stock, trade with breeding animals, the selection and pedigree register, recording and monitoring of production and reproduction. Bee-keeping and fisheries-production sectors are also regulated, as is insemination of farm animals and methods of recognition of breeding male animals, marking and identification of breeding animals and keeping of required registers and records. The Livestock Breeding Act was adopted in 2002. It is harmonized with *acquis communautaire*. The act defines the future organization, breeding programs, joint basic breeding programs, conservation of genetic variability and genetic reserves of farm animals. Recognized breeding organizations, approved organizations, and other recognized organizations will be constituted in accordance with the provisions of the Act. A Livestock Breeding Council has also been constituted with this Act. This is an advisory instrument of the MAFF and will direct professional, economic, and social policy in the field of animal genetic resources in Slovenia.



ANALYZING THE CHANGING DEMANDS IN NATIONAL LIVESTOCK PRODUCTION AND THE IMPLICATIONS FOR FUTURE NATIONAL POLICIES, STRATEGIES AND PROGRAMS RELATED TO AnGR

Within the strategy adopted in 1993, Slovenia committed itself to support the development of eco-social agriculture. The family farm is defined as the central holder of this function because it can be very flexible and can easily conform to the needs of ecological and ethological demands of animal production. Agriculture thus organized can successfully and cost-effectively implement other tasks that are crucial for maintenance of the existing patterns of rural settlement, conservation of lands under cultivation, and for a rich and diverse landscape. In the 21st century, these values will probably be even more important than today. Such a landscape can provide employment and income in rural regions through the development of tourism and other services.

More recently, demographic changes in Slovenia have not significantly influenced the demand for animal products and no unusual development is expected in this area in the near future. However, a higher demand for certain products can be noticed, probably due to the higher purchasing power of consumers, health awareness, and dietary habits adopted from neighbouring countries. This is the case with an increase in consumption of mutton and lamb, fermented dairy products, fish etc. Similar trends are expected to continue in the future. Consumers will pay special attention to food safety and quality. Better knowledge of the nutritional values of foodstuffs will make consumers prefer food products that are believed not to cause the most frequent modern diseases (such as cardiovascular diseases etc.).

To preserve the existing animal genetic resources, suitable implementation of legislation that has been passed since the independence of Slovenia is necessary. They have set the foundations for an eco-social agricultural policy. Eco-social development consents only to sustainable animal production that takes into

ANALIZA SPREMENB POVPRŠEVANJA V ŽIVINOREJI IN POSLEDICE ZA PRIHODNJO NACIONALNO POLITIKO, STRATEGIJE IN PROGRAME, POVEZANE Z ŽGV

S sprejeto Strategijo razvoja slovenskega kmetijstva v letu 1993 in iz nje izhajajočimi dokumenti se je Slovenija odločila, da bo podpirala razvoj ekosocialnega kmetijstva in bo osrednji nosilec kmetovanja družinska kmetija. Ta je najbolj prilagodljiva in najlažje upošteva okoljske in etološke zahteve pri rejih živali. Sočasno lahko tako organizirano kmetijstvo najbolje in najceneje opravi tudi druge naloge, ki so pomembne za ohranjanje poseljenosti dežele, ohranjanje kultivirane zemlje v funkciji ter za pester videz in urejenost krajine. Te vrednote pa bodo v 21. stoletju gotovo še pomembnejše, kot so že danes. Takšna krajina lahko skozi turizem in nekatere druge terciarne dejavnosti omogoči zaposlitev in s tem zaslužek na podeželju.

V zadnjem obdobju demografska gibanja v Sloveniji ne vplivajo pomembne na povpraševanje po živalskih proizvodih in tudi v bližnji prihodnosti ni pričakovati večjih sprememb zaradi gibanj prebivalstva. Zasledujemo pa lahko spremembe v povpraševanju po posameznih proizvodih, ki izhajajo iz povečane kupne moči in ozaveščenosti ter navad porabnikov, prevzetih od sosednjih narodov. Primer za to je povečana poraba jagnjetine, fermentiranih mlečnih izdelkov, rib ipd. Tu pričakujemo v prihodnje še hitrejše spremembe. Posebno pozornost bodo porabniki namenjali prehranski varnosti in kakovosti. Z novim znanjem o sestavinah živil bo vse več ljudi dajalo prednost živilom, za katere velja prepričanje, da ne povzročajo najpogostejših sodobnih vrst bolezni (bolezni srca in ožilja itd.).

Za ohranjanje obstoječih živalskih genskih virov so pomembni po osamosvojitvi Slovenije sprejeti zakoni in uredbe, ki so utemeljili ekosocialno usmerjeno kmetijsko politiko. Ekosocialno gibanje kot edino sprejemljive zagovarja le sonaravne (trajnostne) oblike živinoreje, ki ob zagotavljanju temeljnih ekoloških in etoloških zahtev enakovredno upoštevajo tudi rejca

živali. Prav razvoj in ohranitev alternativnih tehnologij na odmaknjene območjih bosta zagotovila ohranitev živih vasi, ki bodo zaradi okoljsko prijaznih tehnologij zanimive tudi za nekmečko prebivalstvo. Vse več okoljsko ozaveščenih ljudi bo že leto živeti v takšnih vaseh in si prizadevalo organizirati delo na domu, to pa v veliki meri že danes omogočajo tudi sodobne telekomunikacijske tehnologije.

account not only basic environmental requirements and ethological needs of animals but also the needs of producers. The development and maintenance of alternative technologies applied in remote areas will enable the conservation of inhabited villages which, due to the use of environment-friendly technologies, will become attractive to the non-farming population as well. More and more environmentally-aware individuals will opt to live in such villages and will perform their work at home, which is already practicable due to the expansion of information technologies.

PREGLED STANJA NACIONALNIH ZMOGLJIVOSTI IN OCENA ZAHTEV V PRIHODNOSTI

Pristojni organ za ŽGV je Ministrstvo za kmetijstvo, gozdarstvo in prehrano. Strokovno in raziskovalno delo, svetovanje in gospodarjenje z živalskimi genskimi viri ter izobraževanje, povezano z ŽGV, vodijo strokovne ustanove. Rejske organizacije po posameznih vrstah domačih živali pa organizacijsko povezujejo delo rejcev in ustanov. Delo in sodelovanje med ustanovami sta načeloma usklajeni. Ovira je sorazmerno velika razdrobljenost dela in pogosto prevelika specializacija posameznih ustanov na določeno vrsto oz. pasmo domačih živali.

Za strokovno delo in izvajanje rejskih programov je pri vseh vrstah domačih živali na voljo osnovna infrastruktura, ki pa je večinoma zastarela in razdrobljena na več krajih. Za vsa pomembnejša področja ŽGV so na voljo dobro usposobljeni in ustrezno visoko izobraženi strokovnjaki. Vodje in posamezni sodelavci selekcij posameznih vrst domačih živali, molekularnogenetskih laboratorijev, informacijskih sistemov v živinoreji, laboratorijev za napovedovanje genetske vrednosti in genske banke slovenskih avtohtonih pasem domačih živali imajo praviloma doktorat znanosti ter so vključeni v mednarodno znanstveno sodelovanje. V neposredno gospodarjenje z ŽGV so vključeni strokovnjaki z univerzitetno zootehniško in veterinarsko izobrazbo. Vsi zaposleni pri gospodarjenju z ŽGV imajo dobre možnosti za usposabljanje in izobraževanje na domačih in tujih univerzah. Posebna pozornost je namenjena usposabljanju in izobraževanju mladih

REVIEWING THE STATE OF NATIONAL CAPACITIES AND ASSESSING FUTURE CAPACITY BUILDING REQUIREMENTS

6.4

The MAFF is the competent authority in the field of animal production. Professional and research activities, advisory services and management of animal genetic resources, and AnGR related education are conducted in Slovenia by professional institutions. Breeders' organizations, by individual species of farm animals, link together the activities of breeders and institutions. Activities and cooperation among the institutions are, in principle, coordinated. Relatively high fragmentation of activities, and, frequently, too intense a specialization of the participating institutions in a particular species or breed can sometimes be an obstacle for more effective work.

In all species of farm animals, we possess the basic infrastructure for conducting professional work and breeding programs. However, this infrastructure is frequently obsolete and scattered in different locations. All areas involved in AnGR maintain a skilled and sufficiently educated workforce. Heads and individual associates of the branches of particular animal species, molecular-genetics laboratories, animal production information systems, laboratories for prediction of breeding values and gene banks of Slovenian autochthonous breeds of farm animals have normally attained a Ph.D. degree. They are involved in international scientific cooperation. Immediate management of AnGR is conducted by professionals who have attained at least a university degree in zootechnical or veterinary studies. Professional participants in management of AnGR have ample possibilities for training and education in

Slovenian universities and also universities abroad. Special attention is given to training and education of young professionals and experts. Education for the needs of AnGR is organized at all levels. All essential equipment for conducting AnGR related research is available in Slovenia for that purpose.

AnGR information systems in Slovenia have been managed separately with regard to a particular species and have been developed for cattle, pigs, sheep, and goats. They are now in progress for other species. Communications between breeding-program participants and international centres have been established. A uniform AnGR information system is under formation.

The most important AnGR management-related acts are the following: the Agriculture Act, the Animal Protection Act, the Veterinary Act, and the Livestock Breeding Act. They regulate conservation of genetic variability and genetic reserves of farm animals, autochthonous breeds, animal husbandry gene banks, educational and research work, and the application of information systems in the field of animal husbandry.

Slovenia is a member of European and World associations in the field of AnGR: EAAP, ICAR, SAVE, FAO (CGRFA Commission), DAGENE, and others. It cooperates with international breeders' organizations and unions in all species of farm animals.

6.5 IDENTIFYING NATIONAL PRIORITIES FOR THE CONSERVATION AND UTILIZATION OF AnGR

National priorities in conservation and utilization of AnGR in Slovenia are numerous, with the following being the most important:

• preventing overgrowing of agricultural land

Overgrowing of agricultural lands is a consequence of the abandonment of land cultivation. This is an important problem in the development of Slovenia. Together with climatic changes this can have a significant impact on self-supply with animal products. The government will have to provide better for the survival of farms, including smallholder and subsistence farms, in order to achieve a better educational and age structure in farms. Young farm holders will need to receive special economic encouragement to stay on farms and to achieve better education.

strokovnjakov. Na vseh stopnjah zahtevnosti je urejeno izobraževanje za potrebe ŽGV. V Sloveniji je na voljo osnovna raziskovalna oprema za raziskave, povezane z ŽGV.

Informacijski sistemi za ŽGV v Sloveniji so ločeni po vrstah in razviti za govedo, prašiče, ovce in koze. Za druge vrste domačih živali so informacijski sistemi zasnovani. Vzpostavljene so komunikacijske povezave med izvajalci rejskih programov in mednarodnimi centri. Nastaja enoten informacijski sistem za ŽGV.

Najpomembnejši zakoni na področju gospodarjenja z živalskimi genskimi viri so Zakon o kmetijstvu, Zakon o zaščiti živali, Zakon o veterinarstvu in Zakon o živinoreji. Ta med drugim ureja ohranjanje genetske variabilnosti in genetske rezerve domačih živali, avtohtone pasme, genske banke v živinoreji, izobraževalno in raziskovalno delo ter uporabo informacijskih sistemov na področju živinoreje.

Slovenija je članica evropskih in svetovnih združenj na področju ŽGV: EAAP, ICAR, SAVE, FAO (komisija CGRFA), DAGENE in drugih. Sodeluje z mednarodnimi pasemskevimi organizacijami in zvezami pri vseh vrstah domačih živali.

PREGLED NACIONALNIH PREDNOSTNIH NALOG PRI OHRANJANJU IN UPORABI ŽGV

Nacionalne prednostne naloge pri ohranjanju in uporabi živalskih genskih virov v Sloveniji so številne, kot najpomembnejše pa kaže poudariti te:

• ustavitev zaraščanja kmetijskih površin

Opuščanje rabe kmetijskih površin in posledično zaraščanje sta med najbolj perečimi razvojnimi vprašanji države Slovenije. Skupaj s spremenjanjem podnebnih razmer to tudi najbolj vpliva na samoskrbo z živalskimi proizvodi. Država bo morala še bolje poskrbeti za preživetje kmetij, tudi majhnih, in spodbujati mlade gospodarje, da bi se na kmetijah izboljšala izobrazbena in starostna sestava.

•strategija trajnostne oskrbe s hrano

V Sloveniji ni težav z oskrbo s hrano v kvantitativnem smislu, je pa ta zagotovljena globalno, saj skoraj 30 % hrane dokupimo od drugod. Država bi morala imeti strategijo trajnostne oskrbe s hrano, v kateri bi bili zapisani ukrepi za:

- ohranjanje lastnih virov za pridelavo in pritejo hrane,
- zdravo in varno hrano,
- pridelavo in pritejo funkcionalne hrane,
- rabo sonaravnih rastlinskih in živalskih pridelkov,
- izboljšanje prehranskih navad,
- izboljšanje in varovanje zdravja prebivalcev.

•okolju in živalim prijazne tehnologije reje

Rejo domačih živali je treba usmerjati po trajnostnih načelih v smislu ohranjanja narave, zmanjševanja negativnih okoljskih vplivov in upoštevanja etoloških potreb posameznih vrst domačih živali. Zagotovljena morata biti nemotena reja (pravica do kmetovanja) in ohranjanje domače priteje v povezavi s pritejo lastne hrane živalskega porekla in drugimi funkcijami ŽGV (kulturna krajina). Pri tem so posebej pomembni sistemi priteje z majhnim vložkom.

•ohranjanje biotske raznovrstnosti v živinoreji

Prednostna naloga države je nadaljevanje ohranjanja biotske raznovrstnosti v živinoreji, ki jo je v zadnjih dvajsetih letih uspelo ohraniti prav z njeno pomočjo. Poleg sedanjih postopkov ohranjanja, ki temelje predvsem na postopkih *in situ*, je treba v večji meri vpeljati še druge metode: *ex situ*, genetske in strateške rezerve in druge. Prav tako je treba spodbujati delo pri ustvarjanju novih živalskih genskih virov – selekciji novih pasem, sintetičnih populacij, linij ...

Globalno pa je treba doseči dogovor za strokovne opredelitve in določanje pasem, enotne postopke za izračunavanje ogroženosti pasem, minimalna merila za monitoring pasem, strokovne in gospodarske zaslove genskih bank v živinoreji ter poiskati strategije in programe ohranjanja ŽGV na globalni in lokalni ravni. Odločneje kaže opredeliti tudi strategijo do gensko spremenjenih organizmov.

•strategy of sustainable food supply

Slovenia has no problems supplying a sufficient amount of food for its inhabitants. However, almost thirty percent of our food is obtained from sources outside Slovenia. Our country needs a strategy of sustainable food supply. The strategy should contain the following measures:

- proper maintenance of own resources for food production and processing,
- healthy and safe food,
- production of functional food,
- utilization of sustainable products of plant and animal origin,
- improvement of dietary habits,
- improvement and protection of the health of the population.

•environment-and animal-friendly rearing technologies

Rearing of farm animals should be directed according to sustainable principles in the sense of preserving nature, reducing negative environmental impact, and accommodating the ethological needs of all species of farm animals. A right to undisturbed rearing (right to farm) should be ensured along with maintaining subsistent or self-sufficient food-production and other functions of AnGR (conservation of the cultivated landscape). Low input production systems are here of special importance.

•conservation of farm animals biodiversity

The priority of the government is to persist in the policy of conservation of farm animals biodiversity that has been successful for the last twenty years. The existing procedures of conservation that are carried out *in situ* should be enhanced with other types of management: *ex situ* methods, genetic and strategic reserves, and others. Creating new animal genetic resources also needs to be encouraged, e.g. selection of new breeds, synthetic populations, lines, etc.

Agreement needs to be reached globally in order professionally to define and outline breeds, formulate uniform procedures for assessment of the degree of risk to a breed, minimum criteria for monitoring breeds, the professional and economic concept of gene banks in animal husbandry, and to seek strategies and programs for conservation of AnGR on both global and local levels. A strategy in relation to genetically modified organisms also needs to be defined more thoroughly.

•utilization of AnGR - more attention to be accorded to critical areas

In order to improve the state of utilization of AnGR, more authority will have to be accorded to the animal production profession and knowledge. The existing fragmentation of professional activities and information systems should be overcome, so that a uniform information system can be put into effect. In all farm animals, modern methods for predicting breeding value have to be included and new selection methods (monitoring of production, new traits, molecular genetics methods and markers, long-term conservation of genetic materials, direct accessibility of data ...) introduced.

•implementation of national policy in animal production

The priority of the policy is to give effect to the Livestock Breeding Act, especially Chapter II (Rearing of Farm Animals). This chapter outlines the methods of rearing, surface, protected areas, legal rights with regard to rearing of farm animals, ecological and ethological subjects, data bases, and quality of animal products, esp. in the sense of functional food. Healthy and safe food of animal origin plays a special role. The Government needs to define the significance of domestically produced animal products.

•modernization of national infrastructure in animal production

National and other animal production infrastructure needs to be modernized and fragmentation overcome. It is essential to provide continual education and training of human resources on all levels of professional and research work related to AnGR, both at home and abroad. Research activities need to intensify and begin to be involved in joint international projects. A national AnGR gene bank for *ex situ* conservation of genetic materials needs to be established.

•izkoriščanje ŽGV – namenjanje večje pozornosti kritičnim področjem

Za izboljšanje stanja izkoriščanja ŽGV je treba doseči večji vpliv stroke in znanja na področju zootehnik. Preseči je treba sedanj razdrobljenost pri strokovnem delu, pa tudi razdrobljenost informacijskih sistemov in uveljaviti enoten informacijski sistem, pri vseh vrstah domačih živali vpeljati sodobne metode za napovedovanje genetske vrednosti in nove metode v selekcijo (monitoring proizvodnosti, nove lastnosti, vključevanje molekularnogenetskih metod in lastnosti, dolgoročno ohranjanje genskega materiala, neposredna dostopnost do podatkov ...).

•izvajanje nacionalne politike v živinoreji

Prednost ima uveljavljanje določil Zakona o živinoreji, še posebej drugega poglavja Reja živali, s katerim se določajo način reje, prostor, zavarovana območja, pravica do reje domačih živali, ekološki in etološki parametri, zbirke podatkov in kakovost živalskih proizvodov, še posebej v smislu funkcionalne hrane. Pomembna je zdrava in varna hrana živalskega izvora. Država mora določiti pomen lastne prireje živalskih proizvodov.

•posodobitev nacionalne infrastrukture v živinoreji

Nacionalno in drugo infrastrukturo v živinoreji je treba posodobiti, preseči njuno razdrobljenost in poskrbeti za stalno izobraževanje in usposabljanje človeških virov na vseh stopnjah strokovnega in raziskovalnega dela z ŽGV. Raziskovalno delo na vseh področjih ŽGV je treba povečati in ga vključiti v skupne mednarodne projekte. Treba je oblikovati nacionalno gensko banko ŽGV za *ex situ* shranjevanje genskega materiala.



OBLIKOVANJE PRIPOROČIL ZA MEDNARODNO SODELOVANJE NA PODROČJU BIOTSKE RAZNOVRSTNOSTI DOMAČIH ŽIVALI

Na področju ŽGV Slovenija sodeluje s številnimi mednarodnimi organizacijami: EAAP, DAGENE, FAO, SAVE, ICAR, INTERBULL, IDF, APIMONDIA, evropskimi in svetovnimi združenji pri posameznih vrstah domačih živalih. Podatki o slovenskih ŽGV so vključeni v svetovne zbirke podatkov: DAD-IS, EAAP-AGDB in OKLAHOMA STATE UNIVERSITY - BREEDS. Slovenija je vključena v mednarodne raziskovalne projekte in sodeluje z osemenjevalnimi centri v Evropi in svetu. Na področju ŽGV razpolaga z raziskovalnimi zmogljivostmi, tehnologijami, strokovnjaki in raziskovalci ter z znanjem in izkušnjami, ki jih lahko ponudi drugim državam:

- selekcijskimi in rejskimi programi po posameznih vrstah domačih živali,
- informacijskimi sistemi,
- postopki za napovedovanje plemenske vrednosti,
- tehnologijami ohranjanja ogroženih ŽGV po metodah *in situ*,
- molekularnobiološkimi metodami za ŽGV,
- zakonsko ureditvijo za ohranjanje ŽGV,
- dodiplomskim in poddiplomskim izobraževanjem na vseh področjih ŽGV,
- strokovnimi in znanstvenimi delavnicami po posameznih področjih ŽGV,
- plemenskim materialom (žive živali, seme, zarodki) posameznih vrst domačih živali.

Slovenija za uspešnejše ohranjanje ŽGV potrebuje finančno pomoč pri reorganiziraju rejskega in strokovnega dela v živinoreji in še posebej za posodabljanje nacionalnih infrastrukturnih zmogljivosti.

FORMULATING RECOMMENDATIONS FOR ENHANCED INTERNATIONAL COOPERATION IN THE FIELD OF FARM ANIMAL BIODIVERSITY

6.6

Slovenia maintains many forms of cooperation in the field of AnGR: EAAP, DAGENE, FAO, SAVE, ICAR, INTERBULL, IDF, APIMONDIA, and European and World associations of particular breeds of farm animals. Slovenian AnGR data are transferred to the following databases: DAD-IS, EAAP - AGDB and OKLAHOMA STATE UNIVERSITY - BREEDS. Slovenia participates in international research projects and cooperates with insemination centres in Europe and the World. In the field of AnGR, Slovenia have research facilities, technologies, a professional and research workforce, knowledge and experience, which can all also be offered to other countries:

- selection and breeding programs for all species of farm animals,
- information systems,
- procedures for predicting breeding values,
- technologies for conservation of endangered AnGR according to *in situ* methods,
- AnGR-related molecular-biology methods,
- legal measures for conservation of AnGR,
- graduate and post-graduate education related to all fields of AnGR,
- professional and scientific workshops for different fields of AnGR,
- breeding materials (live animals, semen, embryos) of individual species.

To successfully conserve AnGR, Slovenia needs financial support for reorganizing rearing and professional activities in animal production, and especially in modernizing national infrastructure.

VIRI



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Glasnik Muzejskega društva za Slovenijo

Statistični urad Republike Slovenije

Ministrstvo za kmetijstvo, gozdarstvo in prehrano

United States Department of Agriculture

European Commission Directorate-General for Agriculture

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PRILOGE



APPENDICES

PRILOGA
APPENDIX

A

POMEMBNEJŠI STATISTIČNI IN STROKOVNI PODATKI O ŽGV STATISTICAL DATA AND SOME INFORMATION ABOUT AnGR

A1

Priloga / Appendix

Pomen živinoreje v skupnem bruto domačem proizvodu iz kmetijstva
Importance of livestock to the gross domestic product in agriculture

	mio. USD millions of USD	Leto Data from year
Živinorejska proizvodnja Livestock production	455	1999
Druga kmetijska proizvodnja Other agricultural production	373	

A2

Priloga / Appendix

Raba zemljišč in ocena trendov (1000 ha)
Land use and current trends (1000 ha)

Kategorija Category	Površina Area 1991	Površina Area 2000	Trendi Current trends
Njive in vrtovi Arable land	196,8	170,8	-
Trajni nasadi Permanent crops	31,1	29,6	-
Trajni pašniki Permanent pastures	286,6	285,4	±
Kmetijske površine (KZU) Agricultural area (UAA)	514,4	485,8	-
Kopne površine Land area	2013,1	2013,1	
Skupna površina Total area	2027,3	2027,3	

A3

Priloga / Appendix

Struktura kmetij in razdelitev v letu 2000
Farm structure and distribution in year 2000

Kategorija Category	Število kmetijskih gospodarstev Number of farms/ households	%	Število kmetijskih gospodarstev, ki redijo živino Number of farms with livestock	%
Brez zemlje Landless	40	0,0	40	0,1
> 0 to 2 ha	19 799	22,9	14 829	19,1
> 2 to 10 ha	53 262	61,6	49 802	64,1
> 10 to 50 ha	13 167	15,2	12 811	16,5
> 50 to 100 ha	119	0,1	107	0,1
> 100 to 500 ha	65	0,1	41	0,1
> 500 ha	15	0,0	7	0,0
Neznan Unknown	0	0,0	0	0,0
Skupaj Total	86 467	100	77 637	100

A4

Priloga / Appendix

Najpomembnejši živalski proizvodi (1000 t/število)
Major livestock primary production (1000 tonnes/numbers)

Vrsta Species	Meso Meat (t)		Mleko Milk (mil l/mio l)		Jajca Eggs (t)		Volna Fiber (t)		Kože (stev.) Skin (no.)	
	1992	1999	1992	1999	1992	1999	1990	1999	1992	1999
Govedo Cattle	49	46	580	633						
Ovce Sheep	0	1								
Koze Goats										
Konji Horses										
Prašiči Pigs	53	72								
Kokoši Chickens	58	55			22	24				
Pure Turkeys		5,8								
Race Ducks										
Gosi Geese										
Kunci Rabbits										

A5

Priloga / Appendix

Relativni pomen posameznih živalskih proizvodov in drugih rab pri posameznih vrstah (%)
Relative importance of livestock products and services within species (%)

Vrsta Species	Mleko	Meso	Jajca	Volna	Kože	Obvladovanje tveganj	Gnojilo	Delo	Kultura	Rekreacija	Gorivo	Perje	Okoljsko gospodarjenje	Skupaj
	Milk	Meat	Eggs	Fiber	Skin	Risk management	Fertiliser manure	Draught	Culture	Recreation	Fuel	Feather	Environmental Total management	
Govedo Cattle	54	30			1	1	4		2				8	100
Ovce Sheep	23	53			1		4		4				15	100
Koze Goats	48	39					4		1				8	100
Konji Horses		30			2		1	1	6	59			2	100
Prašiči Pigs		94			1	2	2		1					100
Kokoši Chickens		62	35			1	1			1				100
Pure Turkeys		100												100
Race Ducks														0
Gosi Geese														0
Kunci Rabbits		99			1									100

A6

Priloga / Appendix

Relativni pomen posameznih vrst v živalskih proizvodih in drugih rabah (%)
Relative importance of species within livestock products and services (%)

Vrsta Species	Mleko Milk	Meso Meat	Jajca Eggs	Volna Fiber	Kože Skin	Obvladovanje tveganj Risk management	Gnojilo Fertiliser	Delo Draught	Kultura Culture	Rekreacija Recreation	Gorivo Fuel	Perje Feather	Okoljsko gospodarjenje Environmental management
Govedo Cattle	100	25			80	25	53		10				75
Ovce Sheep		1		100	6		3		35				18
Koze Goats							1		2				4
Konji Horses					4		1	100	50	100			3
Prašiči Pigs		35			8	50	25		2				
Kokoši Chickens	35	100				25	17		1				
Pure Turkeys		4											
Race Ducks													
Gosi Geese												100	
Kunci Rabbits					2								
Skupaj Total	100	100	100	100	100	100	100	100	100	100	0	100	100

A7

Priloga / Appendix

Raznovrstnost pasem/Breed diversity

Vrsta Species	Število pasem/Number of breeds								Izgubljene (zadnjih 50 let) Lost (last 50 yr)
	Skupaj Current Total		Ogrožene At risk		Razširjene Widely used		Druge Others		
	L	E	L	E	L	E	L	E	L
Govedo Cattle	3	8	1		2	3		5	2
Ovce Sheep	5	1	2		3			1	
Koze Goats	3	1	1		2			1	1
Konji Horses	4	7	2		1	3	1	4	1
Prašiči Pigs	4	3	1		3	2		1	2
Kokoši Chickens	7	60*	6				1	60*	
Pure Turkeys		3*						3*	
Race Ducks		11*						11*	
Gosi Geese		7*						7*	
Kunci Rabbits	3	43*	3					43*	
Čebele Honey bee	1			1					

* Podatki, zbrani v letu 2002 v društvih gojiteljev malih živali./According to the Small Animals Breeders' Association data for the year 2002.

L = Lokalno prilagojene ali avtohtone./Locally Adapted or Native.

E = Tujerodne (nedavno uvožene in trajni uvoz)./Exotic (Recently Introduced and Continually Imported).

A8

Priloga / Appendix

Število pasem z znanimi osnovnimi živinorejskimi podatki

Number of breeds for which characterization has been carried out

Vrsta Species	Na ravni populacije /At population level			Na ravni živali/At individual level		
	Osnovni podatki Baseline survey	Genetska razdalja Genetic distance	Ocene pasem in križanj Breeds and crosses evaluation	Test lastne proizvodnosti Performance recording	Genetsko ocenjevanje Genetic evaluation	Molekularno ocenjevanje Molecular evaluation
Govedo Cattle	11		11	7	5	3
Ovce Sheep	6	3	6	6	3	3
Koze Goats	4		4	4	2	1
Konji Horses	11	1	11	4		2
Prašiči Pigs	7		7	7	6	7
Kokoši Chickens	7		7	4	4	
Pure Turkeys						
Race Ducks						
Gosi Geese						
Kunci Rabbits	2			2	2	
Čebele Honey bee	1	1	1	1	1	1

A9

Priloga / Appendix

Število pasem, ki so razširjene in imajo rejski program

Number of widely used breeds with breeding strategies

Vrsta Species	Skupno število pasem Total number of breeds	Rejski program/Breeding strategies			Oboje Both
		Čistopasemska selekcija Purebred selection	Križanje Cross-breeding		
Govedo Cattle	5	3			2
Ovce Sheep	3	3			
Koze Goats	2	2			
Konji Horses	4	4			
Prašiči Pigs	5				5
Kokoši Chickens					
Pure Turkeys					
Race Ducks					
Gosi Geese					
Kunci Rabbits					
Čebele Honey bee	1	1			

A10

Priloga / Appendix

Število pasem z rejskimi programi in njihova uporaba

Number of breeds with current breeding strategies and tools being used

Vrsta	Rejski cilji	Načrtovano in izvedeno	Individualno označevanje	Merjenje proizvodnih lastnosti	AI	ET	Genetsko ocenjevanje
Species	Breeding goals	Designed and implemented	Individual identification	Recording			Genetic evaluation
Govedo Cattle	7	7	11	7	6	5	5
Ovce Sheep	6	6	6	6			3
Koze Goats	3	3	4	4			2
Konji Horses	4	4	11	4			
Prašiči Pigs	7	7	7	7	6		6
Kokoši Chickens	4	4	4*	4	4**		4
Pure Turkeys							
Race Ducks							
Gosi Geese							
Kunci Rabbits	2	2	2	2	2		2
Čebele Honey bee	1	1	1	1			1

AI = osemenjevanje/Artificial Insemination

ET = prenos zarodkov/Embryo Transfer

* Tiste jate, ki so vključene v test in odbiro (test v individualnih kletkah)./Those flocks that are involved in the recording of production traits (test in individual cages).

** Občasno/Periodical

A11

Priloga / Appendix

Stanje poznavanja tehnologij/uporabljene metode v rejskih programih

State of the art of technologies/methodologies used in breeding strategies

Tehnologija oz. metodologija Technology or methodology	Raziskovanje Research	Uporaba Used for	Rejci Breeders
Izdelava selekcijskega indeksa za več lastnosti Multi-trait selection index construction	50		50
Orodja za optimizacijo rejskih načrtov Optimization tools for breeding plans	50		50
Elektronska baza podatkov, povezana z shemo zajemanja podatkov Electronic database related to recording schemes	60		40
Programska orodja za genetsko vrednotenje: plemenske vrednosti za fenotipsko selekcijo (uporaba BLUP) Genetic evaluation software for: phenotypic selection breeding values (use of BLUP)	70		30
Tehnologije reprodukcije (UO, ET, itd.) Reproductive technologies (AI, ET, etc.)	15		85
Mikrosatelitske genske karte za identifikacijo kvantitativnih lokusov za selekcijo z genskimi markerji Microsatellite linkage maps for QTL identification for marker assisted selection	85		15
Druge tehnologije Other technology			

A12

Priloga / Appendix

Prioritete pri reševanju kritičnih področij pri razvoju ŽGV
 Priority of needs for utilization of technologies for the development of AnGR

Tehnologija Technology	Kritična področja Needs			
	Znanje Knowledge	Usposabljanje Training	Finančni viri Financial resources	Rejske organizacije Breeder's organization
Merjenje/kontrola Recording	5	5	4	3
Genetsko ocenjevanje Genetic evaluation	5	5	5	2
AI/ET AI/ET	5	5	4	4
Molekularne tehnologije Molecular techniques	5	5	5	4
Rejske organizacije Breed organisations	4	4	3	4

AI = osemenjevanje/[Artificial Insemination](#)ET = prenos zarodkov/[Embryo Transfer](#)

Dodeljene točke (1 = nič, 2 = malo, 3 = srednje, 4 = pomembno, 5 = zelo pomembno), ki prikazujejo prioritete pri reševanju kritičnih področij pri razvoju ŽGV./Assigned scores (1 = none, 2 = little, 3 = regular, 4 = more, 5 = high) to indicate the priority of solving specific needs in order to use technologies to support the development of AnGR.



A13

Priloga / Appendix

Število pasem, ki so vključene v program ohranjanja
 Current number of breeds in managed conservation programmes

Vrsta Species	Skupaj Total	Število ogroženih lokalno prilagojenih pasem Number of locally adapted breeds at risk		
		In situ	Način ohranjanja Managed	Ex situ
Govedo Cattle	1			1
Ovce Sheep	2	2		
Koze Goats	1	1		
Konji Horses	2	2		
Prašiči Pigs	1	1		
Kokoši Chickens	6	6		
Pure Turkeys				
Race Ducks				
Gosi Geese				
Kunci Rabbits				

PRILOGA
APPENDIX**B****PRILOGE K POSAMEZNIM POGLAVJEM
APPENDICES TO CHAPTERS****B1**

Priloga / Appendix

Povprečna letna temperatura in količina padavin v štirih krajih v Sloveniji
 Average annual temperature and the amount of precipitation in four places in Slovenia

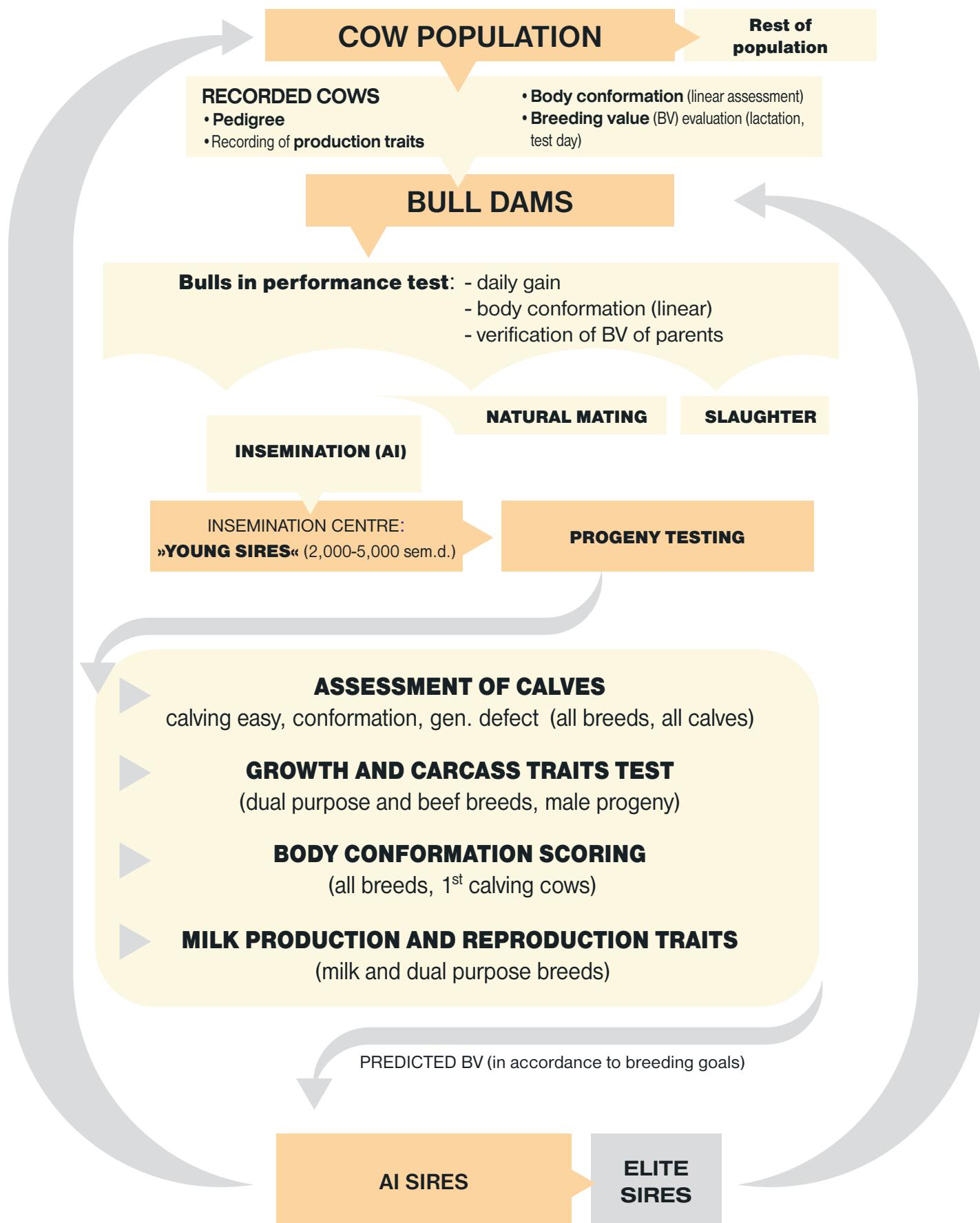
	Povprečna letna temperatura Average annual temperature [°C]	Povprečna letna količina padavin Average annual quantity of precipitation [mm]	Območje Area
Ljubljana	9,8	1 394	osrednje Central
Portorož	13,6	1 050	submediteransko Submediterranean
Kredarica	-1,7	1 997	alpsko Alpine
Murska Sobota	9,2	817	subpanonsko Subpannonian



Model selekcije goved v Sloveniji



Organisation of Slovenian genetic improvement program for cattle





POSTOPEK RAZPOREDITVE REJ V PROIZVODNE SISTEME • METHODOLOGY FOR CLASSIFICATION OF SLOVENIAN LIVESTOCK PRODUCTION INTO PRODUCTION SYSTEMS

Delež rej z majhnim, srednjim in velikim vložkom ter pripadajočega staleža živali je bil ocenjen na način, ki ga priporoča FAO, vendar je bil postopek prirejen slovenskim razmeram. Opredelitev FAO niso povsem enoznačne oz. nedvoumne in zato lahko pričakujemo, da bi bilo proizvodno okolje, ki bi ga na nerazvitih območjih (npr. najmanj razviti predeli Afrike) uvrstili med sisteme z visokim vložkom, na območjih z intenzivno živinorejo (npr. zahodna Evropa) uvrščeno med sisteme s srednjim ali celo nizkim vložkom. Zato je povsem upravičeno pričakovati ključno vlogo strokovne presoje pri pridobljenih informacijah o proizvodnih sistemih. Te imajo v slovenskem primeru podlago v statističnih podatkovnih virih, predvsem podatkih popisa kmetijskih gospodarstev v letu 2000.

Uporabljen način nikakor ne more zaobiti vprašanja subjektivne presoje o intenzivnosti vplivanja človeka na sisteme reje. Po poglobljeni proučitvi različnih možnosti smo ob upoštevanju razpoložljivih podatkovnih virov, ki naj bi kar najbolje pokrili celotno populacijo domačih živali, izbrali razvrstitev staleža živali po posameznih vrstah, ki poteka v dveh korakih. Na prvi stopnji so kmetijska gospodarstva razvrščena v štiri skupine, opredeljene predvsem po tržni usmerjenosti. Zaradi pomanjkanja ustreznejših podatkov je bilo merilo razvrščanja na tej stopnji število živali posameznih vrst na kmetijskih gospodarstvih. V drugem koraku pa je bila opravljena presoja pogostnosti proizvodnih sistemov z nizkim, srednjim in velikim vložkom znotraj posameznih velikostnih razredov rej. Za reje na majhnih (samooskrbnih) kmetijah smo presodili, da je (v povprečju) vpliv človeka bistveno manjši kot na velikih kmetijah in v kmetijskih podjetjih. Pri večini živalskih vrst smo tako največji delež samooskrbnih kmetij uvrstili v proizvodne sisteme z nizkim vložkom. Za kmetijska gospodarstva z velikimi čredami velja obratno. Za vsako živalsko vrsto smo uporabili različna merila razvrstitve, ki so jih potrdili strokovnjaki za posamezno vrsto. Ponazoritev celotnega postopka je v nadaljevanju obrazložena na primeru prasičev.

Pri prvem koraku smo pri prasičih uporabili ta merila razvrstitve:

- samooskrbne kmetije: kmetije s staležem 1-9 prasičev,
- majhne kmetije: kmetije z 10-29 prasiči,
- srednje velike kmetije: kmetije s 30-199 prasiči,
- velike kmetije in kmetijska podjetja: kmetijska gospodarstva z 200 ali več prasiči.

Estimation of the low, medium and high input share of Slovenian livestock production has been carried out on the basis of the modified FAO approach (FAO, 2001). FAO definitions are not very precise and one can expect that the “production environment”, judged as high input in some parts of the world (i.e. Subsaharan Africa), will be treated as a medium input or even a low input in Western Europe. It can therefore be expected that personal judgement will have a high impact on information obtained from some statistical sources of data.

An approach that can not avoid this subjective opinion about the level of human intervention, has been extensively discussed in a group of Slovenian livestock experts and judged to be the most appropriate for the application in Slovenian situation as it stands (i.e. data availability). Classification of farms has been done in two stages. The first stage involves farms' classification into four operation types, done on the basis of herd size (as proxy of farms' market orientation), followed by a second division into “production systems” within the already calculated number of households. Subsistence farms are certainly less managed/modified by human intervention, so (as a rule) the highest share was allocated as a low input production system. The opposite is true for large scale commercial farms. For each species, a separate distribution criterion has been proposed and discussed with local experts. As an illustration of our approach, the whole procedure for pigs is explained below.

The first step classification criteria applied for pigs are:

- subsistence farms: herds with 1-9 animals,
- smallholder farms: herds with 10-29 animals,
- small-scale commercial farms: herds with 30-199 animals,
- large-scale commercial farms: herds with 200 animals or more.

In the second stage, herds, already classified into 4 operation systems, are classified further into production systems. Classification criteria for this second arrangement for pigs, which we believe gives a fair picture of the Slovenian situation, are presented in Appendix C1.

On the basis of these selection criteria, tables with figures of production systems for individual species have been prepared. They show the distribution of farms in different

C1

Priloga / Appendix

Ocenjeni deleži proizvodnih sistemov pri posameznih velikostnih razredih rej
Production systems' portions within individual operation types (expert opinion)

Vrsta kmetijskega gospodarstva Type of operation	Proizvodni sistemi [%] Production systems [%]			Skupaj Total
	Majhen vložek Low input	Srednji vložek Medium input	Velik vložek High input	
Samooskrbne kmetije (do 9 živali) Subsistence (up to 9 animals)	80	20	0	100
Majhne kmetije (10–29 živali) Smallholder (10–29 animals)	20	60	20	100
Srednje velike kmetije (30–199 živali) Small-scale-commercial (30–199 animals)	0	0	100	100
Velike kmetije in kmet. podjetja (≥ 200 živali) Large-scale-commercial (≥ 200 animals)	0	0	100	100

production systems. However, we are not satisfied with the answer obtained. It seems equally interesting and explanatory to have a picture of the distribution of the whole population of animals into production systems. The answer to this question is attainable only when taking into account the actual number of animals in individual herds. One large scale commercial farm can have more animals than 10 thousand subsistence farms. Taking this fact into account, the results obtained for an animal population could be almost the opposite. For the illustration, pig production situation in Slovenia is presented in Appendices C2 and C3.

For other species, herd size criteria that have been applied in the first step of classification are presented in Appendix C4.

Pri drugem koraku pa smo kmetije/črede/reje, ki smo jih že uvrstili v enega od štirih razredov glede na njihovo velikost, razvrstili v proizvodne sisteme. Uporabljena merila za to drugo stopnjo razvrščanja pri prašičih, za katera verjamemo, da izražajo dejansko stanje v slovenski prašičereji, prikazuje priloga C1.

Na podlagi vsebinsko enakih razvrstitvenih meril smo pravili preglednice o proizvodnih sistemih pri posameznih živalskih vrstah. Ti podatki prikazujejo razporeditev kmetij/rej v proizvodne sisteme, to je njihovo pogostnost, izrazeno v odstotku od vseh kmetijskih gospodarstev s proučevano vrsto živali. Vendar pa s takimi podatki nismo bili povsem zadovoljni. Vsaj enako pomembna se namreč zdi zastopanost živali v posameznih proizvodnih sistemih, torej razporeditev staleža v proizvodne sisteme. Do teh podatkov lahko pridemo le ob sočasnem upoštevanju velikosti posameznih rej. Eno veliko kmetijsko gospodarstvo ima namreč lahko večjo čredo živali kot 10 tisoč samooskrbnih kmetij. Upoštevanje tega dejstva lahko da povsem drugačno sliko, kot če razvrščamo samo reje. Obe razvrstitvi, ki ponazarjata stanje v slovenski prašičereji v letu 2000, sta prikazani v prilogah C2 in C3.

Za druge živalske vrste so mejne vrednosti za velikosti čred, uporabljene pri prvem koraku razvrščanja v proizvodne sisteme, prikazane v prilogi C4.

C2

Priloga / Appendix

Razvrstitev rej s prašiči v proizvodne sisteme (%)
Pig farms by production systems (%)

Vrsta kmetijskega gospodarstva Type of operation	Proizvodni sistemi Production systems			Skupaj Total
	Majhen vložek Low input	Srednji vložek Medium input	Velik vložek High input	
Samooskrbne kmetije (skupaj 38 962) Subsistence (38 962 farms)	67,8	17,0	0,0	84,8
Majhne kmetije (skupaj 4707) Smallholder (4 707 farms)	2,0	6,1	2,0	10,2
Srednje velike kmetije (skupaj 2083) Small-scale-commercial (2 083 farms)	0,0	0,0	4,5	4,5
Velike kmetije in kmet. podjetja (skupaj 189) Large-scale-commercial (189 farms)	0,0	0,0	0,4	0,4
Skupaj gospodarstev s prašiči (45 940) Total (45 940 farms)	69,9	23,1	7,0	100,0

C3

Priloga / Appendix

**Razvrstitev staleža prašičev v proizvodne sisteme (%)
Pig population by production systems (%)**

Vrsta kmetijskega gospodarstva Type of operation	Proizvodni sistemi Production systems			Skupaj Total
	Majhen vložek Low input	Srednji vložek Medium input	Velik vložek High input	
Samooskrbne kmetije (skupaj 128 533 živali) Subsistence (128 533 animals)	16,9	4,2	0,0	21,2
Majhne kmetije (skupaj 80 313 živali) Smallholder (80 313 animals)	2,7	7,9	2,7	13,2
Srednje velike kmetije (skupaj 126 517 živali) Small-scale-commercial (126 517 animals)	0,0	0,0	20,9	20,9
Velike kmetije in kmet. podjetja (skupaj 270 972 živali) Large-scale-commercial (270 972 animals)	0,0	0,0	44,9	44,7
Skupaj gospodarstva s prašiči (606 334 živali) Total (606 334 animals)	19,6	12,2	68,2	100,0

C4

Priloga / Appendix

**Uporabljene mejne vrednosti velikosti čred pri razvrščanju rej v razrede tržne usmerjenosti
Classification criteria of herd size into operation systems – applied values**

Vrsta kmetijskega gospodarstva Type of operation	Govedo Cattle	Ovce Sheep	Koze Goats	Konji Horses	Prašiči Pigs	Kokoši Chickens	Pure Turkeys	Gosi Geese	Race Ducks	Kunci Rabbits*	Čebele Honey bee**
Samooskrbne kmetije Subsistence	1-3	1-5	1-5	1-2	1-9	1-19	1-9	1-9	1-9	1-3	1-10
Majhne kmetije Smallholder	4-9	6-15	6-15	3-4	10-29	20-99	10-29	10-29	10-29	4-10	11-50
Srednje velike kmetije Small-scale-commercial	10-29	16-40	16-40	5-9	30-199	100-499	30-99	30-99	30-99	11-50	51-10
Velike kmetije in kmet. gospodarstva Large-scale-commercial	> 30	> 40	> 40	> 10	> 200	> 500	> 100	> 100	> 100	> 50	> 100

* Razvrstitev na podlagi števila plemenskih kunk./Classification according to the number of rabbit does.

** Število čebeljih družin./Number of bee families.





SEZNAM LJUBITELJSKIH PASEM PERUTNINE IN KUNCEV

LIST OF FANCY BREEDS OF POULTRY AND RABBITS

D1

Priloga / Appendix

Velike pasme kokoši / Large fowl breeds

Pasma Breed	Barva Colour	Število živali Number of animals
Amrock/ Amrock	črtasta/barred	82
Apencelska kokoš/ Apenzeller Spitzhauben	srebrno pikasta/silver spangled	10
Araukanska kokoš/ Araucana	črna/black	5
	druge barve/partridge	10
Australorpska kokoš/ Australorp	črna/black	130
Barneveldska kokoš/ Barnevelder	temno rjava/double laced	40
Bilefeldska kokoš/ Bielefelder	značilna/cuckoo red partridge	20
	jerebičasta/laced partridge	55
Brahmanska kokoš/ Brahma	modro jerebičasta/blue partridge	15
	rumena kolumbija/buff columbian	50
	svetla kolumbija/columbian light	150
	temna/dark	10
Brakel/ Brakel	srebrna/silver	3
Faverolska kokoš/ Faverolle	lososova/salmon	25
	rumena*/yellow*	10
Feniks/ Phoenix	jerebičasta/partridge	3
Hamburška lakasta kokoš/ Hamburg	srebrno lakasta/silver spangled	10
	bela/white	17
	črna/black	36
	jerebičasta/partridge	120
Italijanka/ Italian	modra/blue	10
	srebrna/silver partridge	80
	zlata/gold	6
	zlatovrata jerebičasta/partridge goldflitter	10
Kokinkina/ Cochin	črna/black	3
Kura – nova pasma/ Kura	belo rdeča (rjava)**/white red (brown)**	15
Leghorn/ Leghorn	bela/white	68
Marans/ Marans	bakrena/black copper	5
Novohempširska kokoš/ New Hampshire	bela/white	20
	zlatu rjava/red brown	210
	jerebičasta/partridge	10
Orpington/ Orpington	rumena/buff	70
	zlata črno obrobljena/gold – black laced	5
Padovanska kokoš/ Padua	šamotna	15
Plymouth rock/ Plymouth rock	črtasta/barred	150
Rodajlandska kokoš/ Rhode island	rdeča porcelan/red	50
Sumatraška kokoš/ Sumatra	črna/black	10
Suseks/ Sussex	porcelan/porcelain	15
	svetla/columbian light	150
Štajjerka/ Styrian	bela/white	25

Štajerka/Styrian	samonikla/ partridge	345
Velsumerška kokoš/Welsummer	rjasto jerebičasta/ red partridge	90
Vorverška kokoš/Vorwerk	zlato rjava/ red brown	4
Vzhodnofrizijska galebja k./Fries	srebrna/ silver pencilled	10
	zlata/ golden pencilled	10
Yokohama/Yokohama	bela/ white	5
Skupaj/ Total		2192

* Rumena = te barve pri tej pasmi ni v standardu – razvoj v Brežicah./* Yellow = this colour is not in standard – development in Brezice.

** Pasma v razvoju = nova pasma, ki se pojavlja tri leta – Brežice, izdelan je že pasemski standard.

** Developing breed = new breed, three years old – Brezice, completed breed standard.

D2

Priloga / Appendix

Pritlikave pasme kokoši / **Bantam fowl breeds**

Pasma Breed	Barva Colour	Število živali Number of animals
Andaluzijska prtl. kokoš/Andalusian	modra/ blue laced	6
Antverpenska bradata prtl. k./Antwerp Bearded Bantam	prepeličje rjava/ quail	40
	prepeličje srebrna/ silver quail	10
Apencelska koničasto čopa prtl./Apenzeller spitzhauben	srebrno pikasta/ silver pangal	20
Australorpska prtl. kokoš/Australorp	črna/ black	20
	črna/ black	70
Bantam/Bantam	svetla kolumbija/ columbian light	4
	rumena/ yellow	15
Barneveldska prtl. kokoš/Barnevelder	temno rjava/ double laced	10
Brahmanska prtl. kokoš/Brahma	progasto jerebičasta / laced partridge	17
	srebrna/ silver	10
	bela s črnim repom/ white blacktail	35
	črna/ black	15
	rumena z modrim repom/ yellow bluetail	25
	rumena s črnim repom/ yellow blacktail	25
Chabo/Chabo	bela/ white	30
	črna zlatovrata/ black goldflitter	4
	rumena/ yellow	10
	jerebičasta/ partridge	6
	brezova/birchen	5
	rumena z modrim repom/ yellow bluetail	25
Chabo kodravi/Chabo Frizled	rumena s črnim repom/ yellow blacktail	25
	jerebičasta/ partridge	5
Chabo svilnati/Chabo Silky	svetla/ columbian light	6
Drezdenska prtl. kokos/Drezzener	zlato rjava/ redbrown	5
	črna/ black	5
Faverolska prtl. kokos/Faverolle	lososova/ salmon	10
	rdeča/ red	6
	oranžna/orange partridge	30
Feniks prtl./Phoenix	samonikla/ partridge	35
	zlatovrata jerebičasta/ partridge goldflitter	40
	rumena/ yellow	5
Holandska belokapa prtl./Holland White Crested	črna/ black	180

Holandska belokapa prtl./ Hollands White Crested	bela/white	20
Holandska prtl. kokoš/ Holland	jerebičasta/ partridge	10
	jerebičasta/ partridge	20
Italijanka prtl./ Italian	srebrna/laced silver partridge	22
	črna/black	5
	skobčasta/ cuckoo	10
	črna/black	60
	bela/white	10
Kokinkina prtl./ Cochin	rumena/yellow	35
	črno-bela/black white mottled	40
	jerebičasta/ partridge	5
	brezova/birchen	35
Moderna angleška bojevnica prtl./ Modern English Game	zlatovrata jerebičasta/ partridge goldflitter	20
	samonikla/ partridge	25
	samonikla/ partridge	30
Nemška pritlikava kokoš/ German	zlatovrata jerebičasta/ partridge goldflitter	28
	oranžna/ partridge orangeflitter	22
Orlovska prtl. kokoš/ Orloff	pisana/ red porcelain	5
Orpington/ Orpington	črna/black	35
Padovanska prtl. kokoš/ Padua	šamot	35
Plymouth rock prtl./ Plymouth rock	črtasta/ barred	25
	jerebičasta/ partridge	15
Prtl. kokoš z operjenimi nogami/ Dutch Booted	porcelan/ porcelain	55
	citronasto porcelan/ lemon porcelain	48
Renska prtl. kokoš/ Rhenish	črna/black	5
	bela/white	5
Rodajlandska prtl. kokoš/ Rhode Island	rdeča/red	10
Sebright/ Sebright	zlata/black laced gold	110
	srebrna/black laced silver	110
Sulmtalska prtl. kokoš/ Sulmtaler	pšenična/wheaten	25
	bela/white	130
	črna/black	10
Svilnata japonska prtl. kokoš/ Silky Bearded	rumena/yellow	10
	jerebičasta/ partridge	20
Velsumerška prtl. kokoš/ Welsummer	rjasto jerebičasta/ red partridge	35
	bela/white	90
	črtasta/ barred	40
	črna/black	5
	rumena/yellow	10
	srebrna/silver partridge	35
Viandotska prtl. kokoš/ Wyandotte	modra/blue	25
	črno-bela/black white mottled	15
	temna/dark	30
	svetla/columbian light	30
	zlata s črno obrobo/black laced gold	25
	oranžna/ partridge orangeflitter	6
	zlata z belo obrobo/white laced gold	6
Vorverška prtl. kokoš/ Vorwerk	zlatu rjava/ red brown	5
Yokohama prtl./ Yokohama	rdeče sedlasta/ red shoulder	18
	bela/white	10
Skupaj/Total		2189

D3

Pasme rac / Duck breeds

Pasma Breed	Barva Colour	Število živali Number of animals
Bradavičasta raca/ Muscovy	črno-bela/black - white	90
	bela/white	20
Čopasta raca/ Crested	bela/white	10
Kajuga/ Cayuga	črna/black	10
Orpingtonska raca/ Orpington	rumena/buff	10
Pekinška raca/ Pekin	bela/white	15
	samonikla/wild	15
Pritlikava raca/ Bantam	bela/white	15
	modro samonikla/blue wild	15
	ribja kost/fish bone	20
Raca tekačica/ Runner	postrvja/salmon	20
	samonikla/wild	25
Rouanska raca/ Rouen	samonikla/wild	26
Saška raca/ Saxony	modro rumena/yellow - blue	30
Smaragdna raca/ Emerald	smaragdno črna/emerald black	30
Visokoleteča raca/ "High fly"	črna/black	35
Skupaj/Total		386

D4

Pasme gosi / Geese breeds

Pasma Breed	Barva Colour	Število živali Number of animals
Emdemска гош/ Embden	bela/white	18
Kodrava gos/ Sebastopol	bela/white	8
Labodja gos/ Chinese	siva/grey	24
	bela/white	6
Pomeranska gos/ Pomeranian	bela/white	5
	siva/grey	5
Siva gos/ Grey	siva/grey	12
Slovaška gos/ Slovakia	bela/white	6
Tuluška gos/ Toulouse	siva/grey	20
Skupaj/Total		104

D5

Pasme pur / Turkey breeds

Pasma Breed	Barva Colour	Število živali Number of animals
Pura/ Turkey	bela/white	2
	bronsna/bronze	30
	črna/black	10
Skupaj/Total		42

Pasme kuncev v Sloveniji (2001) / Rabbit breeds in Slovenia (2001)

Pasma Breed	Barva Colour	Število živali Number of animals
Orjak/Flemish Giant	siva/grey	277
	železno siva/steel-grey	44
	črna/black	32
	činčila/chinchilla	4
	rumena/yellow	12
Beli orjak/White Giant	bela/white	67
Orjaški lisec/Checkered Giant	črno-bela/black-white	173
	modro bela/blue-white	8
Ovnač/Lop Giant	siva/grey	109
	modra/blue	4
	mišje modra/grey-blue	2*
	bela/white	45
	črno-bela/black-white	2
	madagaskar/madagascar	28
	činčila/chinchilla	36
	rumena/yellow	7
	črna/black	3
	sivo bela/grey-white	2
Veliki svetli srebrec/Champagne d'Argent	modro bela/blue-white	2*
	bela madagaskar /madagascar-white	21
Veliki srebrec/Silver Giant	srebrna/silver	47
Velika činčila/Chinchilla Giant	črna/black	34
Beli novozelandec/New Zealand White	bela/white	115
Obarvani dunajčan/Vienna	modra/blue	78
	siva/grey	28
	črna/black	2
Burgundec/Burgundy	rumena/yellow	24
Hotot/Blanc d'Hotot	bela/white	23
Kalifornijec/Californian	bela/white	86
Beli dunajčan/Vienna White	bela/white	8
Rdeči novozelandec/New Zealand Red	rdeča/red	49
Japonec/Harlequin	rumeno črna/yellow-black	4
Tribarvni lisec/Rijnlander	črno-rumeno-bela/black-yellow-white	24
Zajčar/Belgian Hare	kostanjeva/chocolate	33
Tirinški kunc/Tiringer	tirinška/tiringer	29
Beloresavec/Beloresavec	črna/black	61
Češki lisec/Bohemian Spot	črno-bela/black-white	2*
Aljaska/Alaska	črna/black	12
Hvanec/Havana	havana/havana	18
Mali ovnač/Lop	siva/grey	6
Brezovec/Squirrel	sivo bela/grey-white	17
Delienaar/Delienaar	rdeča/red	11
Marburški sivec/Marburger Feh	siva/grey	3
Kuna/Sable	modra/blue	2*
Biserni sivec/Silver Fox	divje modra/agouti blue	8

Angleški lisec/ English Spot	belo-črna/white-black madagaskarska/ madagascar	1 4
Mali srebrec/ Silver	rumena/yellow črna/black	4* 11
Holandec/ Dutch	črno-bela/black-white rumeno bela/yellow-white	4 2*
Mala činčila/ Chinchilla	činčila/chinchilla	4*
Ožganec/ Tan	črna/black rjava/brown modra/blue	26 16 4*
Ruski kunc/ Himalayan	črno-bela/black-white	2
Pritlikavi ovnač/ Dwarf Lop	madagaskar/madagascar	3
	črna/black	7
	siva/grey	10
	ruska/himalayan	3*
	črno-bela/black-white sivo bela/grey-white siamska/siamese brezova/squirrel	6 7 4 12
Hermelin/ Hermelin	rdečeoki/red eyes modrooki/blue eyes	28 8
	siamska/siamese	2*
	kuna/sable	7*
	ruska/himalayan	16
	črna/black siva/grey	6* 12
Obarvani pritlikavec/ Netherland Dwarf	modra/blue tirinška/tiringer hotot/hotot brezova/squirrel japonska/harlequin boloresasta/boloresasta činčila/chinchilla	2* 3* 2 23 3 3 1*
	kostanjeva/chocolate	15
	modra/blue	19
	dalmatinska/dalmatinian	9
	črna/black	6
	bela – rdeče oči/white – red eyes	7*
	bela – modre oči/white – blue eyes	3
	rumena/yellow	3*
	japonska/harlequin kunje rjava/sable brown	3 3*
Angorec/ Angora	kunje modra/sable blue	3*
Satin/ Satin	bela/white	9
Lisičar/ Fox	rdeča/red	16
Pritlikavi lisičar/ Dwarf Fox	bela/white bela – rdeče oči/white – red eyes	8 1*
Slovenski kunc/ Slovenian Rabbit	mišje modra/grey-blue pepelnato rjava/oshi brown	16 4
Skupaj/ Total		2082
* Leto 2000/ Year 2000		



**STANJE ŽIVALSKIH GENSKIH VIROV
V SLOVENSKEM KMETIJSTVU**

**STATE OF FARM ANIMALS
GENETIC RESOURCES IN SLOVENIA**