

# **Lithuanian Domestic Animal Genetic Resources – Nowadays and Future Perspectives**

**(Country report to the FAO)**



**National Consultative Committee**

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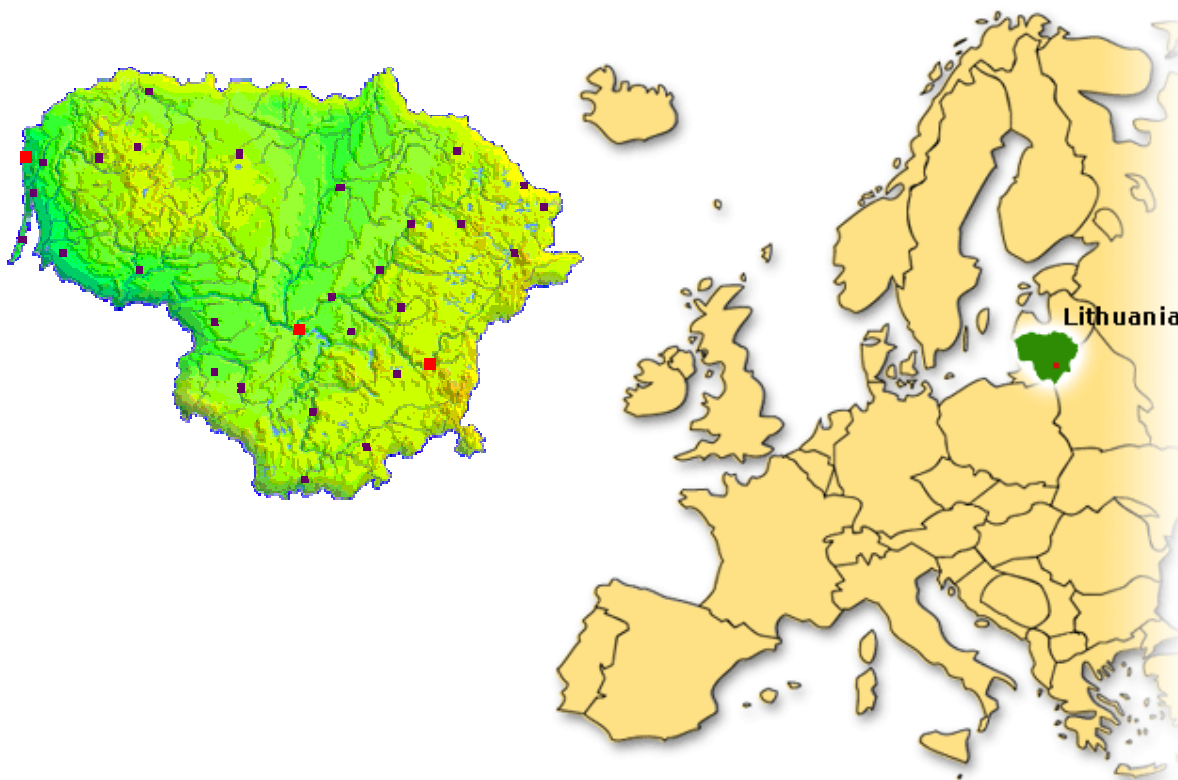
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Lithuania is a state located in the geographical centre of Europe with a thousand years of history (Lithuania's name was mentioned for the first time in sources – Kvedlingburgh chronicles – in 1009). Lithuanians are the Balts. The Lithuanian language belongs to the Indo-European language group and is one of the oldest languages in the world.

Lithuania is bigger than two neighbouring Baltic States – Latvia and Estonia – both in terms of area and number of population. The total area of Lithuania is 65,5 thousand m<sup>2</sup> and the population 3,48 million out of which 83,5 % are Lithuanians. The capital of Lithuania is Vilnius. The currency of Lithuania is Litas which was pegged to the EU currency EURO at the exchange rate 1 Euro = 3,4528 Lt.

Lithuania is a country of beautiful nature and unique historical and cultural heritage. Lot of objects have already been included into the UNESCO World Cultural Heritage list – one of them is archeological historical museum – sanctuary of Kernavė. It is an old Lithuanian capital which features all epochs from the X millennium before Christ to the early Middle Ages. That is why Kernavė is sometimes called Lithuanian Troy. The second object is Cross making arts (2001). Traditional Lithuanian crosses are wooden art pieces with features of sculptures and often with elements of architecture and smothery forming a peculiar Lithuanian art branch. The remaining objects are Kuršių Nerija and old towns of Lithuanian cities, reminding of old rich Italian towns like Rome and Florense.

Today the Republic of Lithuania is a rapidly developing state in all areas, a commercial and transit link of Eastern and Western countries.

## **1. Lithuania and agricultural sector**

### **1.1. The share of agriculture in the national economy**

The development and efficiency of agriculture, the quality of the farmers' life depend very much on both the external and internal environment of agricultural business. Natural conditions such as the climate and soil are the most stable external factors.

Soil in Lithuania is mostly of average productivity, similar to that in other countries of this region – Poland, Denmark, southern Scandinavia. But in respect of the duration of the vegetative season and average temperatures our country has favourable conditions, although compared to the conditions of its northern neighbours, Lithuania is in a relatively better situation.

Natural conditions in Lithuania are suitable for the development of dairy and meat farming, horticulture, production of pigs, flax, cereals, potatoes, sugar beets, rape and other crops and livestock characteristic of this latitude; the conditions are also favorable for the development of bio-organic agriculture.

The geopolitical situation of Lithuania is rather good. Lithuania is located at the geographical centre of Europe close to international trade routes. It has rather good motorways and its territory is crossed by east-west and north-south international transport corridors.

Lithuania is an active member of the United Nations Organizations, member of the West European Union Pact, it participates in the activities of World Trade Organization (WTO), UN Food and Agriculture Organization (FAO), International Bank for Reconstruction and Development (IBRD), the International Monetary Fund (IMF).

The level of the microenvironment is rather different, which is transparent in the increasing wealth differentiation among farmers and agricultural enterprises, differences in skills, qualifications and abilities to act in the conditions of market economy.

There are individual farmers and agricultural enterprises, which have already developed a satisfactory environment for agricultural business activities. They have consolidated their parcels of agricultural land, which are well maintained, they have suitable facilities, technology, experienced and qualified employees. The Lithuanian agricultural sector, however, is dominated by small, inefficient farms with shortages of both material and financial resources. Such farmers are only partially employed, their income is low.

The agricultural sector in Lithuania performs very important economic, social, environmental and ethno cultural functions, therefore it is considered to be priority sector in national economy. It creates working places also in other sectors related to the manufacture

of agricultural machinery, equipment, other agricultural inputs, services and the processing of agricultural products.

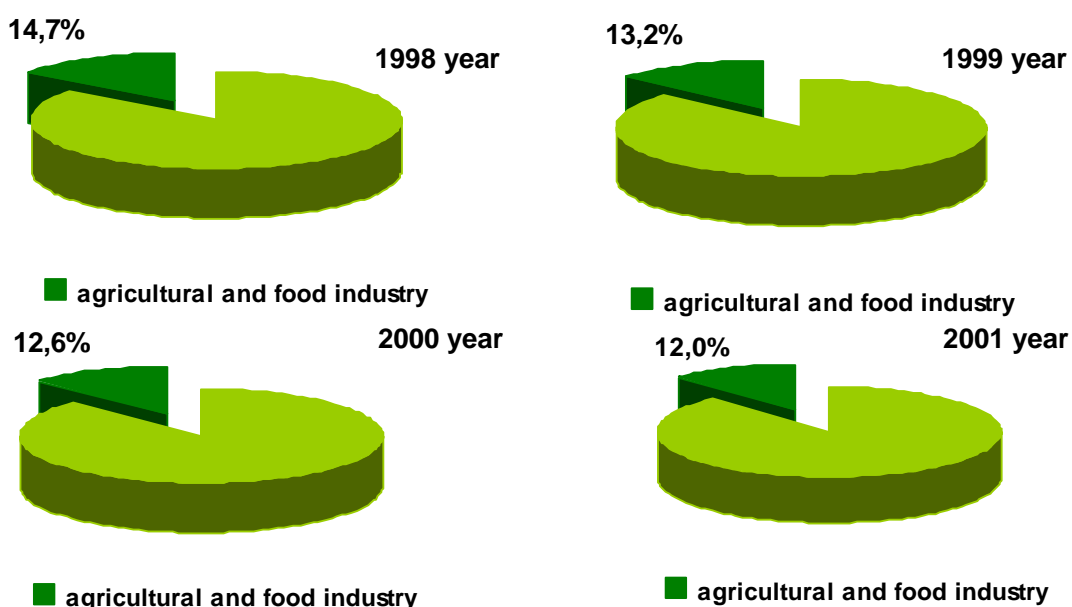
**Table 1. Macroeconomic indicators of the agricultural and food sector in 1998-2002**

Indicators	1998	1999	2000	2001*	2002*
Gross domestic product at current prices, mill. Litas	43555	42608	44698	47498	50679
Total agricultural production at current prices, mill. Litas	7113,5	5699,9	4910,0	5042,3	5006,7
Share of agriculture in gross value added, %	9,9	5,4	7,9	7,1	7,0
Exports of agricultural and food products, mill. Litas	2082,7	1509,1	1786,2	2268,2	2182,2
Share of agricultural and food products in total exports, %	14,0	12,6	11,7	12,4	10,8
Imports of agricultural and food products, mill. Litas	2538,2	2166,4	2209,1	2453,5	2368,0
Share of agricultural and food products in total imports, %	11,0	11,3	10,3	9,4	9,1

In 2002 Lithuanian Gross Domestic Product (GDP) increased 6.7 % in comparison with 2001. A significant share of GDP is created in agricultural and food sector. In 2002 it comprised 7 % in GDP.

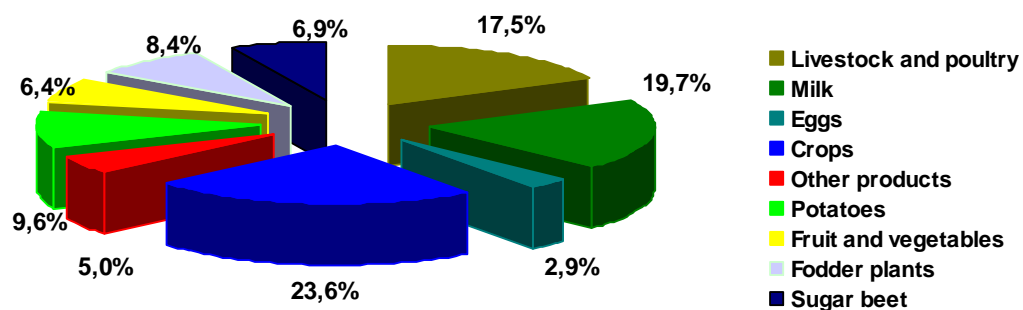
Agriculture is closely integrated in the Lithuanian economic and social life. The living standards and well-being of the total population depend very much on the quality and prices of food products. On the other hand, the purchasing power of the population determines the demand for agricultural and food products, the economic viability and income of the agricultural sector.

**Figure 1. Lithuanian Gross Domestic Product (GDP)**



With the restructuring of the national economy, the importance of agriculture for national economy is gradually diminishing, which causes the reduction of labour force engaged in agriculture and of the share the agricultural sector has in the gross value added and exports. Those trends determine the reduction of the budget allocations to agriculture from the national budget.

Figure 2. Structure of gross agricultural production in 2002



The structure of agricultural production has changed significantly during the recent decade. The largest areas are grain, milk and meat. In meat sector half of the production belong to pig farming.

The majority of the agricultural production was produced at farmers and other individual farms - over 80 % of crop production and 73 % of livestock production.

National agriculture is capable of producing sufficient supplies of the main food products for domestic consumption. Lithuania is dependent on the imports of only certain kinds of cereals, vegetable oil, vegetables and fruit, i. e. mostly of those kinds of food products which are not produced in our latitude.

Table 2. Beef market situation and forecasts

	1997	1998	1999	2000	2007
Production (1000 t)	90	81	77	75	66
Consumption in domestic market	71	79	66	66	57
Self – sufficiency	+19	+3	+11	+9	+9
Annual consumption per capita (kg)	19,0	21,2	17,8	17,5	15,4

**Table 3. Milk market situation and forecasts**

	1997	1998	1999	2000	2007
Number of cows (in thou)	583	538	494	480	453
Productivity (kg)	3345	3587	3470	3387	3700
Milk production (in thou t)	1950	1930	1714	1626	1676
Consumption in domestic market (in thou t)	958	979	1100	1080	1092
Self - sufficiency	+ 992	+ 951	+ 614	+ 546	+ 584

Traditionally the national milk sector is export – oriented. Changes in the trade pattern with Russia and other CIS states and establishment of new partner relations in other markets resulted in the reduction of dairy exports. In 2002 it comprised 32 % of total export.

1998 – 2002 years period meat export tendencies were unstable because of changes in the market. Beef meat comprised 36 – 42 % in total meat export and its export significantly decreased because of BSE in EU countries.

Meat and meat product import played a certain role in the reduction of production in Lithuania, especially that of poultry and pork. As a result of expensive feed and its high consumption levels, Lithuanian pork became non-competitive. During last 5 years meat import grew 1.7 times. The major part in meat import comprised poultry meat.

## 1.2. Human resources in agriculture

In 2002 years the population of Lithuania was 3475,6 thousand people of which rural residents were 1149,4 thousand (33,1 % of total population).

**Table 4. Number of rural population employed in agriculture in Lithuania 1998-2002**

Indicators	1998	1999	2000	2001	2002
Number of rural population, thou.	1162,9	1159,2	1155,0	1152,8	1149,4
Share of rural population in total population, %	32,6	32,8	32,9	33,1	33,1
Average annual number of employer in agriculture, thou.	319,9	303,1	280,4	218,1	235,8
Share of the employed in agriculture in total employed number, %	20,0	19,1	18,4	16,4	16,8
Employed in manufacture of food products and beverages, thou.	64,5	64,3	64,9	60,3	...
Share of the employed in manufacture of food products and beverages in total employed number, %	3,9	3,9	4,1	4,0	...



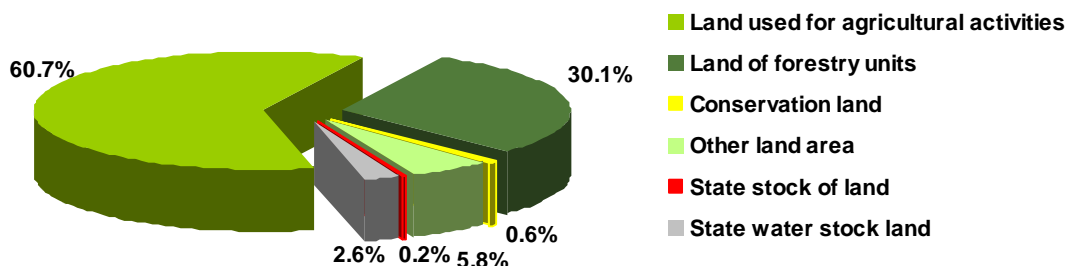
The rural population structure is not changing significantly during last years – there are more women than men. The average age of rural residents is constantly increasing. The average rural population density is 18,0 people per km<sup>2</sup>.

Economical situation determines activity character of rural residents. 51 % of rural residents are engaged in agriculture, 35 % in service area, the rest – manufacturing and building industry. The rather large number of people engaged in agriculture is determined by the low efficiency of labour, partial employment and small farms.

### 1.3. Land resources

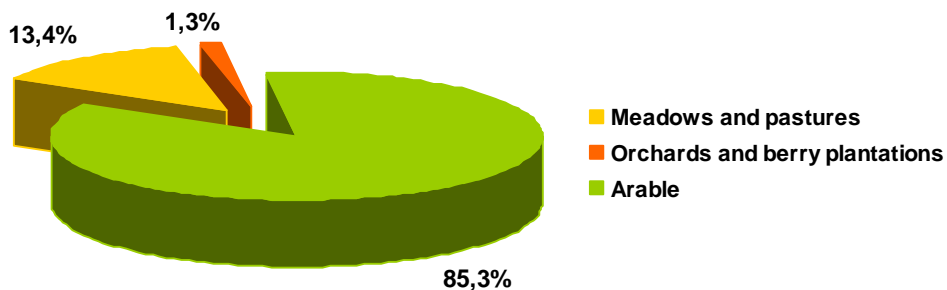
Lithuania's territory covers 65,3 thousand km<sup>2</sup>. Forests occupy 1809,6 thousand hectares, water bodies – 21,9 thousand hectares, roads – 23,0 thousand hectares. Protected areas – national and regional parks, reserves and reservations cover 11,5 % of the territory of the country.

Figure 3. Total land area.



Land used for agricultural activities comprises 60,7 % of total land resources.

Figure 4. Structure of agricultural land used for agricultural activities.



Lithuania do not use all agricultural land efficiently. In 2002 such state – owned or state – managed land, not granted for use or leased, covered 423,2 thousand hectares (12,6 % of total agricultural land).

**Table 5. Agricultural land used for agricultural activities by owners and users in 2002**

Land owners and users	Agricultural land	
	thou ha	%
<b>Private land used for agricultural activities:</b>	<b>1996,4</b>	<b>59,3</b>
land used by members of horticulturist associations	13,4	0,4
land used for agricultural activities	1983,0	58,9
<b>State-owned or state-managed land:</b>	<b>1372,9</b>	<b>40,7</b>
state-owned land used by horticulturist associations and their members	3,1	0,1
land of houseland farms	493,3	14,6
land used by state enterprises, educational establishments	14,8	0,4
land leased by agricultural partnerships	71,6	2,1
land leased by other natural and legal entities	366,9	10,9
land non-granted for usage and non-leased	423,2	12,6
<b>Total</b>	<b>3369,3</b>	<b>100</b>

Lithuania has three main farm types: farms, agricultural partnerships and individual farms.

**Table 6. Number of agricultural entities in 1998-2002**

Agricultural entities	1998	1999	2000	2001	2002
Registered farmer farms, thou	66,9	67,0	67,6	29,6	39,7
Agricultural partnerships and enterprises, number	1205	963	878	697	657
Households, thou	313,9	300,3	274,6	244,0	230,8

Although the average size of registered farmers' farms close to the EU average, still having evaluated the number of abovementioned farms and their land area, the average farm in Lithuania covers 5,4 hectares.

Lithuania still has a very small number of specialized farms. There prevail mixed, crop and animal production cultivating farms. Nevertheless, in productive areas there emerge large (over 30 ha) farms engaged not only in crop but also milk and meat (pig, poultry) production.

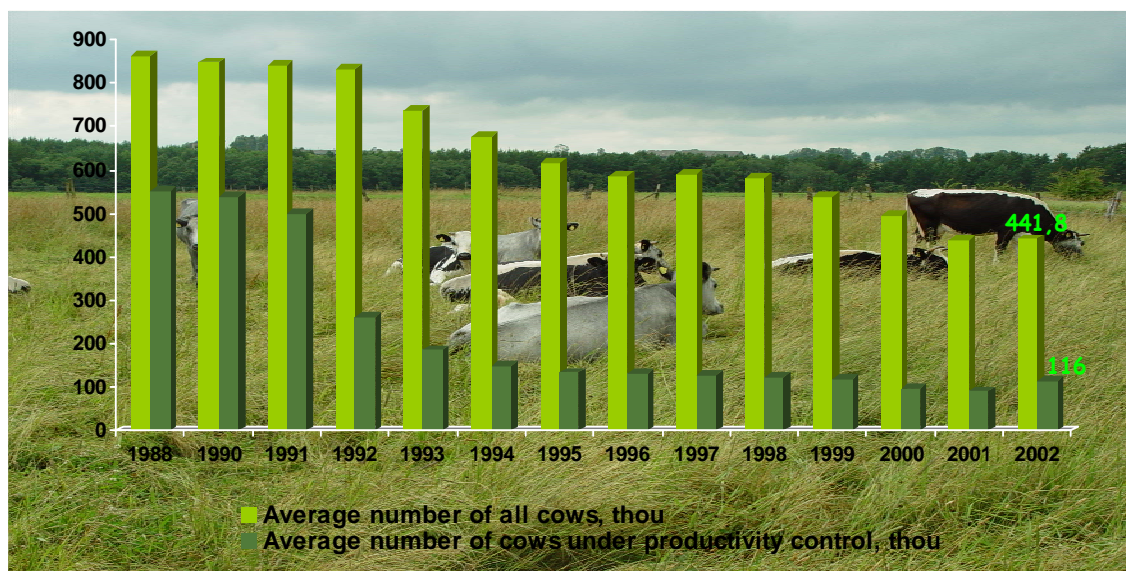
## 2. Animal production systems

### 2.1. Milk sector

From the economic point of view the sector of milk is identified as a branch of agriculture with a comparative advantage. In 2002 milk production made up 19,7 per cent of the total value of agricultural production, whereas the export of dairy products made up over 32 per cent of the total exports of agricultural and food products. In the Strategy for Agricultural and Rural Development in Lithuania, the dairy sector has been acknowledged as a priority branch of agriculture.

Changes in the milk production have been caused by the period of transition from a planned to market economy. In 2001, in comparison to 1998 the number of cow reduced by 12%. In 2002 the number of cows kept stable. Individual farmers keep about 92 % of cows and produce 91 % of total milk production.

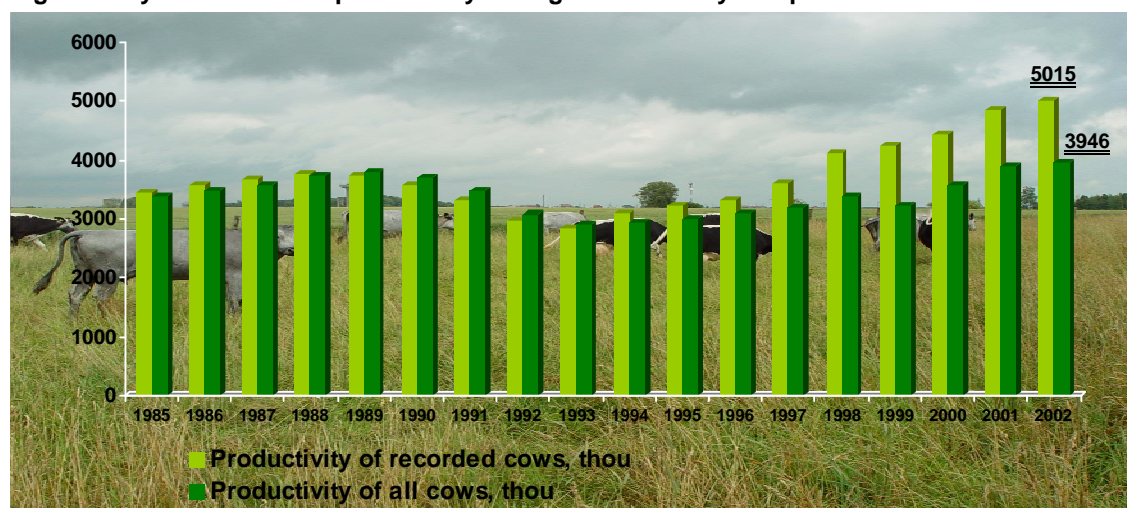
Figure 6. Dynamics of cows' population during 1988 – 2002 years period



The average milk yield is comparatively low. According to the Department of Statistics, in 2002 the milk yield per cow reached 3946 kg. The average milk yield of controlled cows in 2002 amounted to 5015 kg. 30 % of cows are under productivity control.

Small dairy farms take a dominant position in Lithuania. In 2002 milk was produced by 197,4 thousand farmers and 176 agricultural partnership farms. On average in 1 farm is kept 2,1 cow. Only 0,9 % of all farms keep 10 and more cows. They keep 16 % total cow populations.

Figure 6. Dynamics of milk productivity during 1985 – 2002 years period



Cooperation among dairy producers would certainly strengthen the position of dairy farms. However, due to negative attitude shared by farmers towards the cooperation the latter's development has not experienced much progress, but the situation is slightly changing.

Table 7. Groups of farms by cow number in 1998-2002 year

Groups by cow number	1998 10 01		2001 10 01		2002 10 01		2002, compared to 1998, %	
	farm No	Cow No	farm No	Cow No	farm No	Cow No	farm No	Cow No
1-2	200091	273020	183519	247989	161398	216313	81	79
3-9	41178	149469	34394	129342	34357	135760	83	91
10-19	535	6441	773	9503	1291	16075	241	250
20-29	77	1798	118	2696	230	5275	299	293
30-49	61	2322	74	2808	128	4706	210	203
>=50	391	69585	208	41335	212	41139	54	59
Of which:								
farmer farms	9	574	24	2212	67	4935	7,4 times	8,6 times
agricultural partnerships	382	69011	184	39123	142	36494	37	53
<b>Total</b>	<b>242333</b>	<b>502635</b>	<b>219086</b>	<b>433673</b>	<b>197616</b>	<b>419268</b>	<b>82</b>	<b>83</b>

Depending on the size of the farms, the level of modernization and productivity of cows, milk production costs on the farms of farmers milk-producers range very much. Milk production costs in small farms are lower because buildings and equipment depreciation

and maintenance related expenses there are much lower than those born by the large farms. However, these farms cannot produce high quality milk and introduce the latest technology. Milk production in Lithuania is characterized by seasonality (seasonal ratio – 2,4).

## **2.2. Meat sector**

Lithuania offers relatively good conditions for meat production - favourable natural conditions, qualified staff, livestock breeding traditions and experience, unexpensive land and labour.

Meat production in total agricultural production comprised 8,5 % in 2002 year. Recently in Lithuania two main milk type cattle breeds have been raised – Lithuanian black and white cattle and Lithuanian Red cattle. There were no purebred beef cattle. Nowadays beef cattle breeds are introduced into Lithuania and bulls are used for crossbreeding with milk type cows.

Nowadays meat is mostly produced from culled cows and heifers, fattened bulls and crossbred milk – beef cattle, the number of which is constantly increasing. Cattle for slaughtering are raised in comparatively small farmers farm with 2 – 5 cattle of which 1 – 2 are cows.

Meanwhile, the predominant type of cattle breeding in Lithuania is extensive pasturing; no industrial cattle breeding for meat is practiced. Special cattle fattening technologies have been started to be introduced. The latter are characterized by balancing pasturing and combined feed.

Pig-breeding farms are also small. 79 percent of the farmers and household farms had 1-9 pigs and only 21 percent – more than 10 pigs.

67 % of poultry are grown in large poultry yards.

## **2.3. The Most important animal products**

Lithuania has suitable conditions for animal production which are favourable natural environment, feed resources, as well as animal raising, milk and meat products' production traditions and experience. Therefore animal production is a priority sector in agricultural economy.

Table 10. The production of most important animal products in 1995 – 2002, in thou t

Year	Meat slaughter weight, thou t	Milk thou t	Eggs thou t	Wool thou t
1995	208,2	1818,9	793,1	80
1996	198,6	1831,5	750,9	57
1997	200,9	1949,7	798,2	56
1998	202,3	1929,9	792,6	48
1999	192,9	1714,2	728,2	33
2000	186,4	1724,7	692,0	30
2001	150,5	1729,8	742,3	35
2002		1752,0		

In 2002 the volume of animal production increased by 5 %; meat by 8 %, eggs by 6 % and milk by 1 %. 1752 thousand tons of milk were produced in 2002. This makes up 20 % of the total value of agricultural production and 43 % of the value of animal production.

Table 11. Production of main dairy products in 1998-2002, in thou t

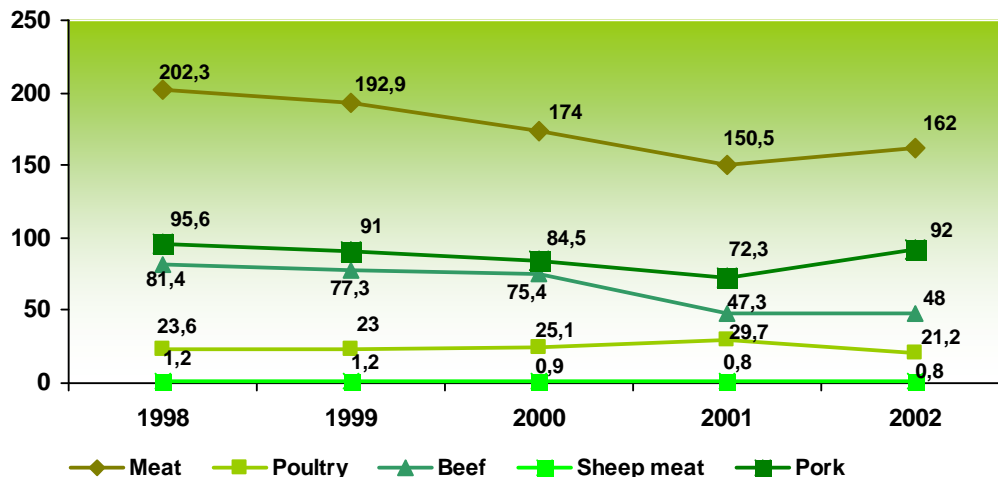
Dairy products	1998	1999	2000	2001	2002	2002, compared to 1998, %
Milk	80,9	73,0	75,1	77,2	81,3	100,5
Cream	0,9	1,0	1,0	1,1	1,2	137
Kefir, sour milk	28,9	27,5	26,1	29,0	31,1	109
Yogurt	2,8	6,3	5,7	6,8	11,7	307
Sour cream	19,8	17,6	17,9	19,1	21,0	106
Curd	12,6	11,7	11,0	11,1	11,7	93
Cottage cheese	6,0	5,3	5,1	5,3	5,6	93
Butter and other milk fats and oils	35,9	26,3	19,4	18,1	17,4	48
Fat cheese	35,8	35,5	41,6	50,6	49,7	139
Dried milk and whey products	32,9	26,6	18,2	17,7	15,6	47
Ice cream	13,8	13,0	12,3	14,0	15,8	114
Lactose	1,7	0,6	4,8	5,3	5,1	299
Canned dairy products	12,4	9,2	3,5	5,3	8,8	71

In the period of 1998 – 2002 year the range of dairy products changed a lot. The production of yogurt increased nearly 4 times, as well as cream, fat cheese and lactose, while production of butter and dried milk decreased nearly twice.

There is a tendency of increased consumption of milk products in Lithuania. During last 5 years it increased nearly 38 %.

Main meat production by sorts are beef, pork and poultry meat. Sheep, goat and rabbit meat is produced by small amounts and is not important in total meat production balance. During last 5 years meat production is decreasing. The produced meat is used mostly in home market, which is comparatively small because of low buying capacities.

Figure 7. Meat production by sorts in all category farms in 1998-2002



Traditionally in Lithuania there is production of all different sorts of meat products. During last 5 years ready – to – cook meat products production decreased nearly twice canned meat products approximately 300 times.

### 3. Lithuanian Domestic Animal Genetic Resources (AnGR)

#### 3.1. Characterization of AnGR

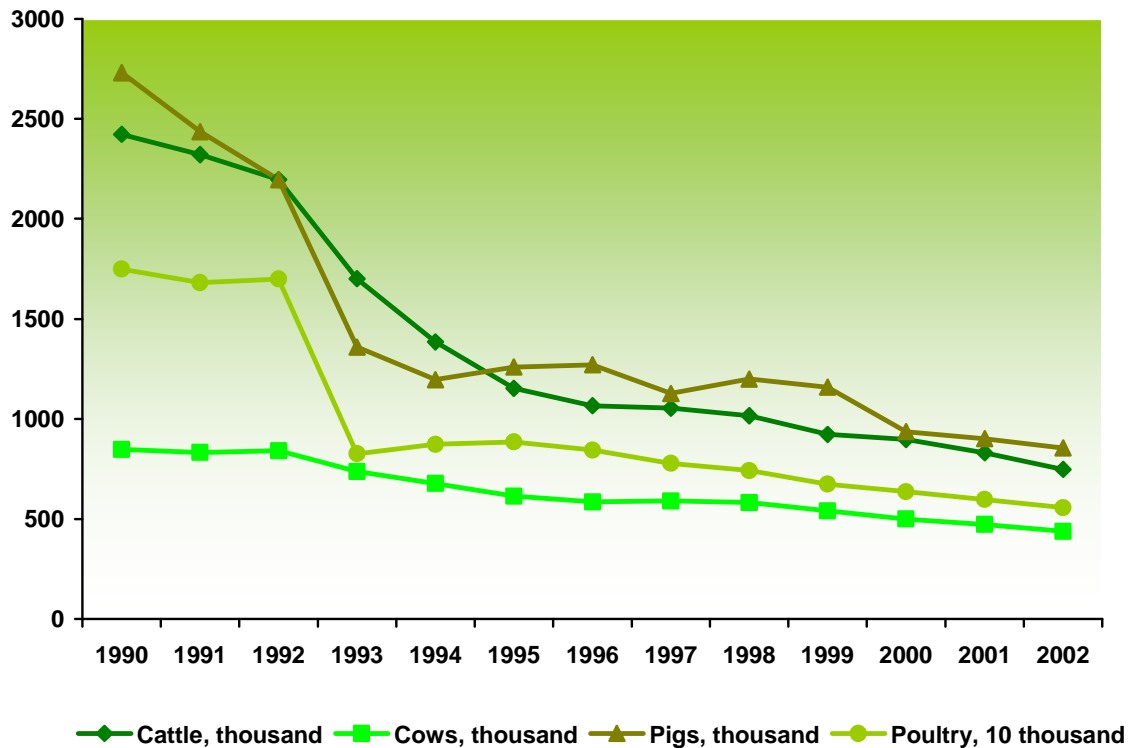
Lithuanian Animal Genetic Resources consists of cattle, pig, horses, sheep, goat, poultry, fur animals, beehives.

The dynamics of the number of livestock and poultry in 1990 – 2002 shows high rate of their decrease during observed period. The number of livestock at the end of 2002 accounted for 31 percent of the number of the cattle bred in 1990, that of pigs 31 percent and poultry 32 percent accordingly. The main reasons for the decrease in the number of livestock are as follows restructuring of the agricultural sector and essential changes in

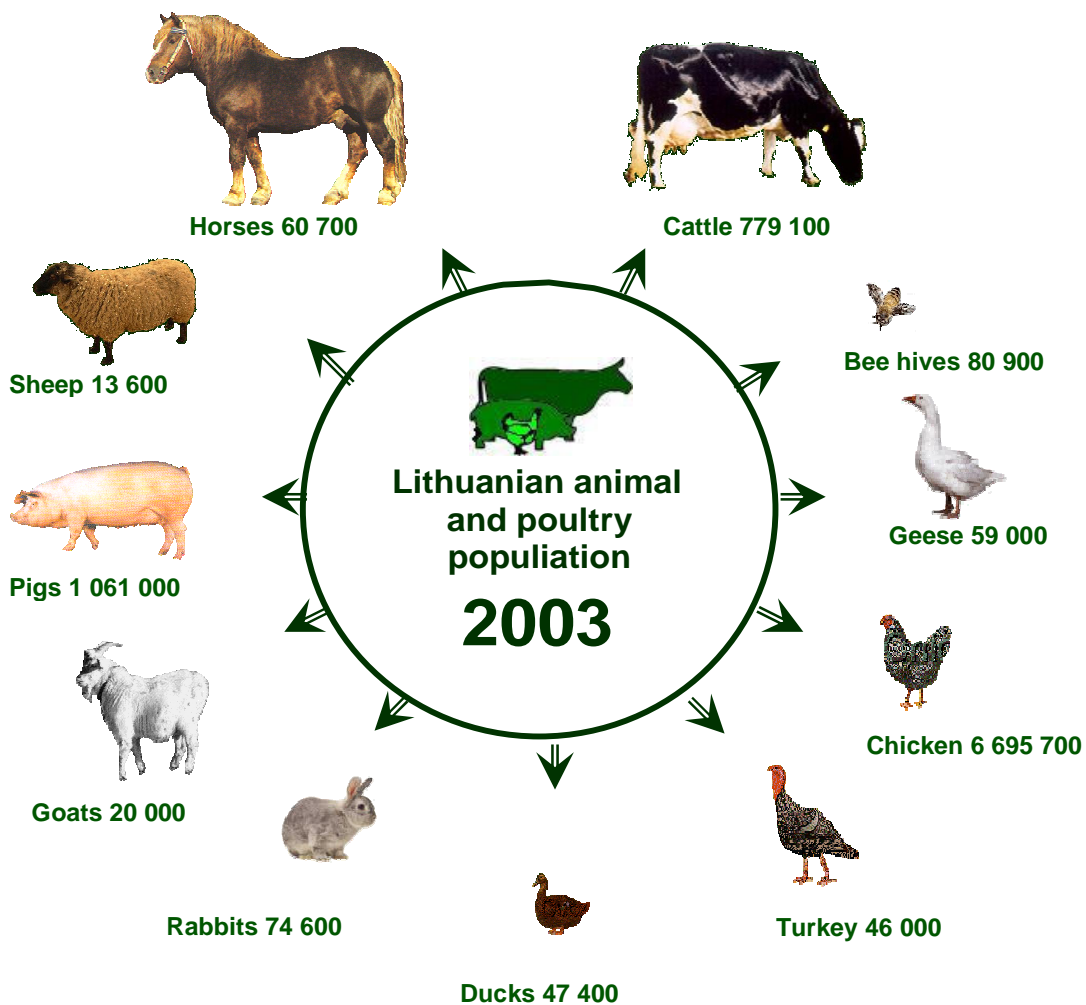


domestic and foreign markets, the reduced consumption of meat. In 2002 – 2003 there is a tendency to slight increase of animal and poultry number.

Figure 7. Dynamics of the number of livestock and poultry in 1990 – 2002.







In Lithuania we have more than 20 cattle breeds of which 4 breeds are local – Lithuanian Black and White and Lithuanian Red (modern breeds) and Lithuanian Light Grey and Lithuanian White Backed (indigenous). Recently introduced breeds comprises less than 3% from total amount of cattle – German Black and White, British Friesian, Dutch Black and White, Holstein, Danish Black and White, Swedish Black and White, Angler, Danish Reds, Ayrshire, Brown Swiss, German Red and White, Swedish Red and White...

Few beef cattle breeds – Charolay, Hereford, Limusine, Aubrak and Simental – have been started to be raised in Lithuanian few years ago.

Figure 7. Distribution of cattle by breeds in Lithuania

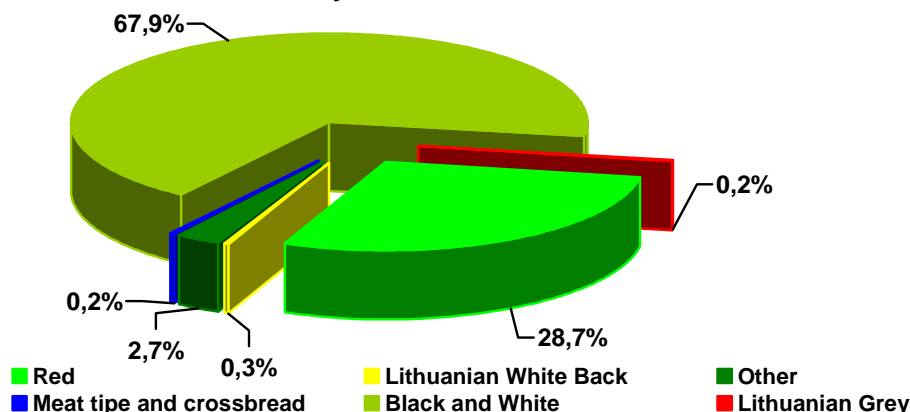


Figure 8. Black and White cattle breeds

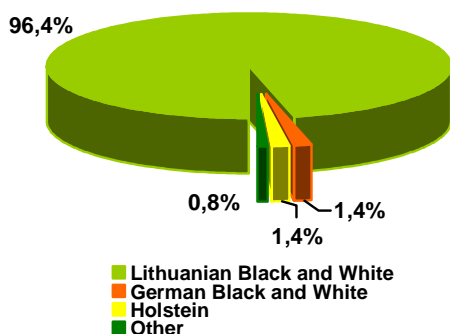
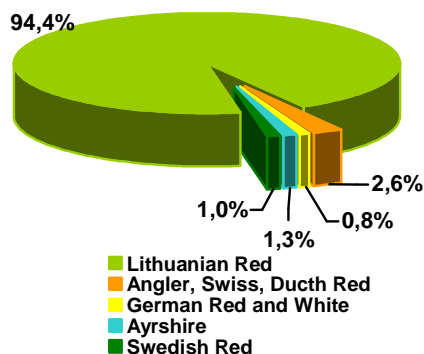
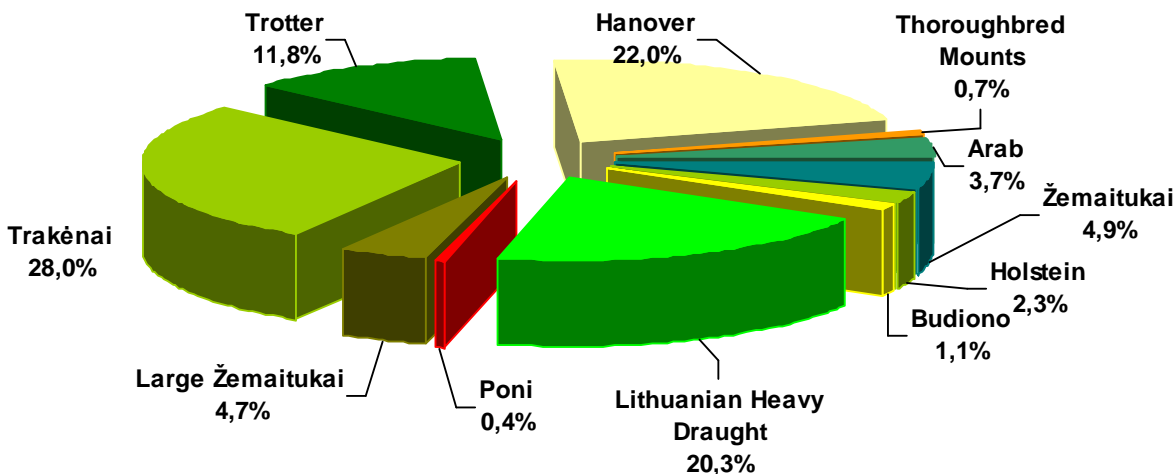


Figure 9. Red cattle breeds



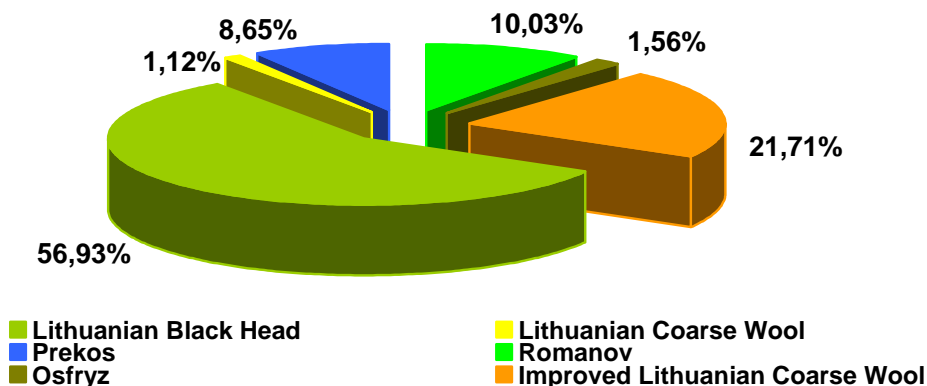
In Lithuania we have 3 native horse breeds – Žemaitukai, Large type Žemaitukai and Lithuanian Heavy Draught. All these breeds have status of endangered breeds. Breeding institutions and herds also keep horses of Trakėnai, Hanover, Holstein, Russian and American Trotters, Thoroughbred Mounts, Arab, Budioni and Poni. 90 % of horses in Lithuania are work horses and 10 % riding horses.

Figure 10. Distribution of horses by breeds in breeding farms and herds in Lithuania



In Lithuania there are 5 sheep breeds from which 2 are native – Lithuanian Black Head and Lithuanian Coarse Wool. Both breeds are under conservation. The introduced breeds are Romanov, Ostfryz, Prekos. Some farmers recently started to breed Berishon Dusher and Suffolk. The most popular is Lithuanian Black Head sheep breed which covers more than 60% of all kept sheep.

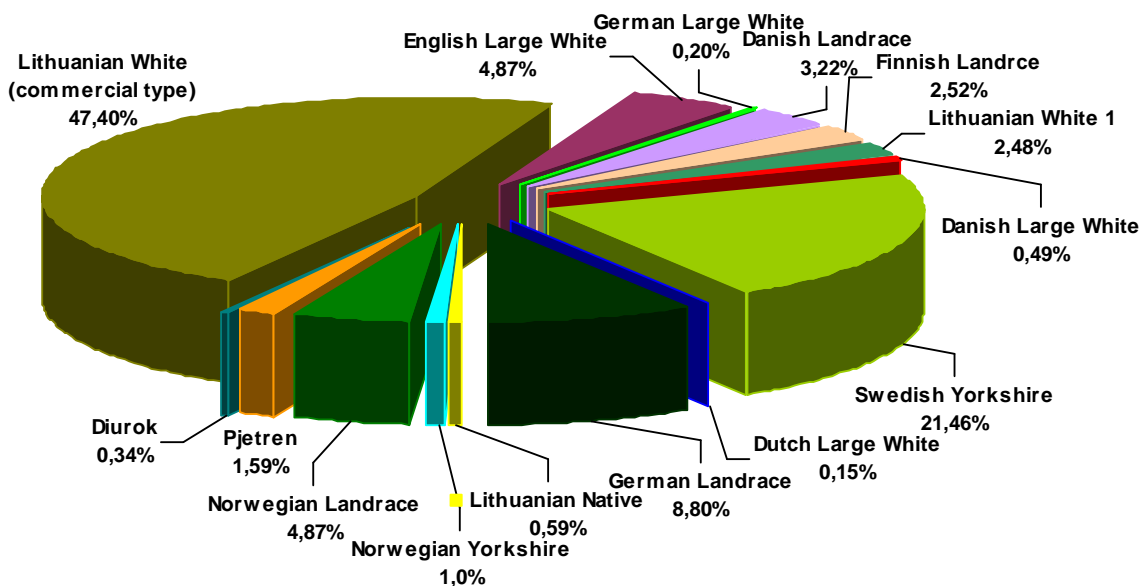
Figure 11. Distribution of sheep by breeds in Lithuania



In Lithuania mainly is bred commercial type of Lithuanian White pig breed. It comprises about 50 % of total bred pigs. The other native pig breed is Lithuanian native pig (Pig with wattles) which is very much diminished in numbers and is under conservation.

The introduced breeds from which sows mainly used in Lithuania are Swedish Yorkshire, English Large White and Norwegian Landrace. The introduced breeds from which boars mainly used are Large White, Pjetren and Norwegian Landrace.

Figure 11. Distribution of pigs by breeds in Lithuania



The most distributed in Lithuania is local goats but goat breeding herds also breed Zaanen, Czech White, German White, Togenburg, Russian and other purebred and crossbred goats.

Lithuania had one second rank turkey reproduction farms, and 7 second rank chicken and goose reproduction farms. Reproduction farms breed laying and meat chicken breeds, (ROSS 208, 308; COBB 500; Misex Brown and White Lohman Brown, Lohman LSC; IZAI), imported Italian White, Rein Meat, China, Grey Big geese breeds, Big-5, But-8 and But-9 turkey crosses.

Breeding herds include rabbits of French Ram, Belgian Giant, Rex, New Zealand and Viennese Giant breeds.

### 3.2. The utilization of animal genetic resources

**Lithuanian Black and White** cattle were created by crossbreeding local livestock with different breeds at first, and then with Dutch black and white cattle, Ostfriesian, and Swedish Black and White cattle, years and later, by crossing those hybrids. Single Dutch Black and White cattle appeared in Lithuania as far back as in the 16-17<sup>th</sup> centuries. A committee for breeding Dutch Black and White cattle, established in 1901, started registration of such livestock into an origin book. The committee used to organize evaluation of cattle as well as exhibitions. In 1909 the first cow productivity control group was set up in

Kaunas province, and in 1911 Kaunas Agricultural Society started buying thoroughbred bulls for coupling centers.

Until World War I, Dutch Black and White cattle had the biggest influence on local southeastern livestock and some of those in the regions of central Lithuania. After the war, mostly Ostfriezer and Swedish black and white cattle were being taken to the above regions. From 1930, hybrids of Dutch black and white cattle were heavily interbred



among themselves. The development of Lithuanian Black and White cattle was shaped in a major way by livestock productivity control, their selection based on milking capacity and milk fatness, exterior and weight, as well as entries into herd books, cattle exhibitions and competitions.

After the creation of a unified stock-breeding system, taking into consideration the development trends and tendencies of cattle farming, the selection of Lithuanian Black and White cattle also started following other important farming and economic factors. Insemination of cows and heifers with the bull sperm frozen in liquid nitrogen was introduced. In addition, a lot of Lithuanian Black and White cattle were being improved with Dutch Black and White livestock.

Lithuanian Black and White cattle were recognized an independent breed in 1951. At that time Black and White cattle were not yet productive enough; they were yielding skim milk, and had numerous exterior shortcomings. In order to eliminate these defects. Dutch Black and White cattle were brought in again in late fifties. Based on intensive selection using Dutch Black and White cattle, a new genotype of Black and White livestock was formed.

Today Lithuanian Black and White cattle have strong constitution, well-proportioned yet often too compact bodies. Thanks to their short legs, deep and wide chest, wide crest, back, and waist, long and wide rear, and well-developed muscles they are often more similar to milk-meat cattle.

Black and White cows in Lithuania yield on average 4 790 kg milk containing 4.28% fat and 3.26% protein.

Black and White cattle in Lithuania are identified and registered; their productivity is controlled, and herd books issued. The national Lithuanian Black and White Cattle Selection Program has been prepared, and approved by the Lithuanian Black and White Cattle Improvers Association, which is responsible for the implementation of the program.

The improvement process of Lithuanian Black and White cattle with bulls from productive related breeds should be continued. However, Lithuanian Black and White cattle

herds of old genotype have to be preserved as well in order to retain a great number of valuable qualities.

Lithuanian **Red cattle** breed was raised in Lithuania by crossing local cattle with Danish Red livestock; at places, Angler were used, and somewhere else, Swiss, Latvian Brown, Swedish Red and White, and even Simentals were used for crossbreeding. However, it was Danish brown livestock that played the major role in the development of Lithuanian Red cattle breed.



In 1892, 40 red heifers with calves and 2 bulls from Denmark were imported to Ginkūnai estate (Šiauliai country). The estate served as a starting point for Danish Red cattle that spread around northern Lithuanian regions, thus improving local livestock. Later, until the outbreak of World War I, a few bulls and heifers were being brought in on a regular basis. As breeds were not divided into districts at that time, cattle were brought in regardless spreading of individual varieties. Only later large groups of red cattle started forming in northern and eastern regions of Lithuania.

The foundation of the first cattle control group in Vabalninkas in 1907, and the Lithuanian Red Cattle Society in 1924, as well as the appearance of herd books boosted the development of the red breed. In 1941 the first farms of Lithuanian Red cattle stockbreeding were started; bonitation of cattle was initiated, and cooperative and state coupling centers were restored. During World War II, a lot of cattle were destroyed. Thus the postwar year was the time to restore stockbreeding. Latvian Brown and Estonian Red bulls were brought in to improve Lithuanian Red cattle.

In 1951 Lithuanian Red cattle were recognized as an independent breed.

A new improvement stage for Lithuanian Red cattle started in 1956 after launching the first cattle insemination stations, and starting insemination of cows by great numbers as well as importing Danish Red cattle. Danish Red bulls improved milking capacity, weight, and constitution of Lithuanian red cattle; they also sped up the maturing process, but failed to increase milk fat level.

Lithuanian Red cattle are of milky type: rather small and dry head; long and rather narrow neck with little muscle, without dewlap; long and deep waist; long, deep and wide chest; notch behind shoulder-blades is a seldom case. Legs are of medium length, and



regular stand; hide thin and elastic, udder medium-sized, not hanging down; teats cylindrical, not conical. Cattle of this breed are brown with different shades of hue ranging from ripe cherry red to red-brown. Some cattle have lighter-colored back and a circle around the mouth, white udder, and sometimes also white underbelly.

Lithuanian Red cows yield on average 4 489 kg milk containing 4.43% fat and 3.39% protein.

Lithuanian Red cattle are identified and registered; their productivity is controlled, and herd books issued. The Lithuanian Red cattle improvement program has been prepared, and approved by the Lithuanian Red Cattle Breeders Association, which is responsible for the implementation of the program.

### Lithuanian Light Grey

cattle has been known in Lithuania since, ancient times yet it has come close to extinction as a result of the long-term chaotic improvement with different black and white and red and white breeds bulls, widespread sorting out in large farm herds due to improper colour without taking into consideration other properties. There is some evidence light grey ashy cattle were also bred



and could still be found in Scandinavia, Latvia, and some regions of Russia.

The biggest number of Light Grey cattle can still be found in private farms; they have retained their colour characteristic and qualities. A lot of cattle breeders value them for their easy adaptation to environment, good health, easy feeding and keeping, calm temper, good quality milk, and vitality.

Grey livestock breeders were not following any breeding programs, which led to different breeding, feeding, and keeping conditions; as a result, grey cattle fall to different types according to their development, exterior and farming qualities. This breed is considered milk type, though some of cattle fall into the category of milk-meat livestock.

In Lithuania Light Grey cattle are mostly bred in southeastern, and southwestern regions. The colour of ash cattle range from grey-bluish to ash grey; some of them have almost white legs and head. Ash colour or ash hair, used to refer to the colour of livestock, is only used in the Lithuanian language.

Lithuanian Light Grey cows produce on average 4489 kg milk containing 4.35% fat and 3.26% protein.

Lithuanian Light Grey cattle breed should be preserved and improved while retaining its individual, characteristic complex of qualities. In order to preserve the gene stock of Light Grey cattle, relict gene-stocking herds have been formed at the Practical Training and

Research Center of Lithuanian Veterinary Academy, Lithuanian Institute of Animal Science, where cattle are bred by pure breeding, and their biological-farming qualities are studied there.

The **Lithuanian White Back** cattle is an indigenous breed found mostly in south-eastern regions of Lithuania. It is known, that white-backed cattle also were bred in the north-eastern regions of Poland, Scandinavian countries and some regions of Russia. From



the ancient times they were bred also in Lithuania. In the beginning of the 20th century the number of animals was relatively high, but until now those native cattle were bred without systematic breeding, have been intensively improved by different black and white or even red cattle breeds. In 1995 conservation of Lithuanian White Backed cattle started by finding the most typical animals in private farms. 2 indigenous cattle herds, with pure breeding was formed.

According to size, body confirmation and milk productivity traits, this breed belong more to dairy cattle type, but there is possible to find animals with traits common to the dairy – beef productivity type. The milk yield and milk quality traits of Lithuanian White Back cows is not lower than of the wide-spread cattle breeds in Lithuania. The average milk yield of Lithuanian White Back cows is 4577 kg, the milk content 3.98% of fat and 3.26 of proteins.

According of colour Lithuanian White Back cattle can be divided into two types: first type has black spots located on the white background, the second type has completely black head, neck and sides and white back. Also can be found animals with untypical brown colour. In general, the animals have characteristical white back and white side, light, forward oriented horns. The breed is known for its adaptation to the locally prevailing climate, produces milk of good quality and the animals have a strong constitution.

The Domestic Animal Gene Bank of K. Janušauskas Animal Genetics Laboratory stores DNA samples of cattle breeds. Local cattle are identified and registered; there are under productivity control. However, small farms with just one or two cows pit their cattle ancur control. Besides, cows are inseminated with accidental bull sperm in such farms. Herd books have not yet been prepared; however, data is being collected. The gene stock of Lithuanian local cattle is in satisfactory condition at the moment; however, in the nearest future it is necessary to ensure that cattle are bred by pure breeding following planning not



only in gene-stocking herds but also in private farm herds. For that purpose, a selection program for Lithuanian Light Grey and white back cattle has to be prepared.



Lithuanian **Native pigs** developed in Lithuanian ethnic lands following natural selection and introduction of some imported pigs. Their colour range is quite wide: white, black, brownish, but in most cases – motley, both long- and short-eared. The most striking morphological feature is beads under the neck. Native pigs are fattened, less demanding in terms of feeding and

keeping conditions, and insensitive to direct sunlight, thus suitable for grazing. There were quite a lot of pigs after World War II (especially in the Southeast); however, they were rapidly disappearing from large farms as Lithuanian White pigs were being spread. By the end of the XX century, there were only single pigs remaining, which were still interbred with pigs of other breeds. Thus in 1993 a herd of complete genealogical structure was formed of remaining pigs found after expeditions thus recreating a mini population of Lithuanian Native pigs at the Lithuanian Institute of Animal Science. Before that no breeding-selective work had been performed. However, starting with first Native pig litters farrowed at the Institute, all pigs are identified and registered, and undergo productivity control both at the Institute farm and the pig control fattening station. Based on the data collected at the Institute, in 1998 Lithuanian Native pig breeding-selective plan was prepared as well as evaluation rules for Lithuanian local pigs. The Native pig herd of the Lithuanian Institute of Animal Science has been recognised Lithuanian Native pig breeding nucleus farm with stable amount of 150-200 local pigs; unfortunately, this is the only herd of Native pigs. Private people only keep single Native pigs. Despite of collection of origin and productivity data on several Lithuanian Native pig generations, the herd book has not yet been prepared. Thanks to the number of identified-registered Native pigs, as well as regular monitoring, and direct supervision from the Lithuanian Institute of Animal Science, the status of Lithuanian Native pigs can be considered critical-supportive with stable minimal number of pigs.

The improvement process of Lithuanian Native pigs, initiated after World War I, also marked the start of development of **Lithuanian White** pig breed, even though the breed was only recognised in 1967.

The process of improving Lithuanian White pigs with large and middle-sized White, Edelsweine, Berkshire, and local Danish pigs formed an opinion that the best crossing breeds are Large White ones and those related to them. Year after year the number of used breeds was decreasing and finally the process was limited to spreading just White Large



(Yorkshire) and partly German Edelsweine pigs. Financial support to farmers helped to acquire Large White pigs for breeding, which led to big numbers of large white pigs and their hybrids with local pigs spreading throughout the country; they served as a basis for further pig breeding and bacon pig raising as well as the Lithuanian White pig breed. After World War II, further selection and development of the breed's genealogical

structure and thoroughbred herds completed bacon Lithuanian White pig breed that is used as mother breed in industrial crossing combinations. In the market, with growing demand for less fatty pork but without completed industrial crossing system as well as falling demand for thoroughbred young pigs, Lithuanian White pig breeding-farms, aiming to improve carcasses of meat for sale, started wide application of crossbreeding and rejected Lithuanian White boars. Due to shortage of boars and leaving hybrid sows for herd substitutes, the number of thoroughbred Lithuanian White pigs started rapidly decreasing. As the Lithuanian White pig breed was created by using pigs of other breeds, it was decided to breed Lithuanian White pigs following the principle of open population, preserving only the breed name.

This threatened the existence of the breed. In order to preserve the Lithuanian thoroughbred type of White pigs, the Lithuanian Institute of Animal Science developed a mini population of complete genealogical structure. A program for selection of Lithuanian White pig breed was worked out, which included measures for preserving the thoroughbred type in at least a few of breeding-farms. The State Pig Breeding Station, together with Lithuanian Pig Breeders Association, should take care of the stockbreeding activity as well as preservation of Lithuanian White pigs.

**Žemaitukai** is an ancient Lithuanian local breed of horses having unique genetic information. This breed was known already in VI-VII centuries, and became especially famous during the XIII-XIV century wars with the Crusaders, when they proved to be excellent fighting horses. Žemaitukai are supposed to have descended from eastern steppe horses that were brought to Lithuania by Indo-Europeans about 5 thousand years ago; they were evolving together with the Lithuanian nation. Since XIX c. Žemaitukai have been used for agriculture, transportation, and export.



Rapid decline of Žemaitukai horses after 1990 was caused by changes in the national economic life, and deranged activity of the stockbreeding system. In 1994 the total number of Žemaitukai horses reached its lowest point, only 30. In the beginning of the Žemaitukai preservation activity, horses of this breed only amounted to 0.03% of total number of horses raised in Lithuania. A preservation program started at the Lithuanian Institute of Animal Science in 1994 as well as formation of thoroughbred herds, monitoring, and analysis of farming-biological

qualities stopped the decline of Žemaitukai horse breed, and today its effective population ( $N_e$ ) is 55; however, the breed remains under the threat of extinction.

Established in 1997, the Žemaitukai Horse Breeders Association has prepared and been implementing the Žemaitukai breeding program, as well as keeping the herd book. Starting with 1948, data on thoroughbred Žemaitukai were entered into general state books on horse herd. However, inconsistent nature of such records could not give a realistic picture of the breed status or the improvement course. The first herd book of Žemaitukai breed, prepared and issued in 2002, included 104 thoroughbred horses. There being no common horse identification system in Lithuania, Žemaitukai horses are identified by the description of their characteristics.

Žemaitukai are universal horses belonging to the pony class. Their height at withers range from 128 to 142 cm, weight 360-420 kg, and chest size from 154 cm up to 187 cm. Žemaitukai are distinguished by quite weighty body, but thin yet strong legs and energetic character provides these horses with agility and manoeuvring abilities. They are good for working, travelling, riding, breeding, hypotherapy, and sports.

Until World War II Žemaitukai were taking part in horse testing and have achieved good results in strength testing, cart races on lake ice, and long distance (60-80 km) trotting. With the breed coming close to extinction after World War II, only large horses were being tested. In 2001 the Žemaitukai Horse Breeders Association initiated the evaluation of horse working abilities by testing their jump power, trotting speed, and endurance.

Žemaitukai attract attention with their exterior and colours. At the moment majority of them are bay or black; others are light bay, dark bay, and mouse-dun.

The Žemaitukai breed gave rise to such breeds as Trakėnai, Lithuanian heavy horses, and large Žemaitukai horses. The Žemaitukai breed was recognised as worth preserving on the international level.





The breed of **Large Žemaitukai** horses started evolving at the end of the XIX c., when small Žemaitukai horses could no longer meet the farming needs. At that time Žemaitukai were crossed with trotter (mostly Orlov breed) stallions or stallion hybrids of these breeds in the north-eastern part of Lithuania, while in south-eastern part of the country Žemaitukai were crossbred with northern Swedish

stallions or stallion hybrids. Such crossbreeding followed by inside breeding led to the creation of a much larger and stronger local horse called, together with an old type Žemaitukas, a local horse. Later, around the year 1946, this type of horses was separated from Žemaitukai, and called Eastern Lithuanian driving horses. In 1949 the latter breed together with Žemaitukai was given the joint name of Žemaičiai (Samogitian) breed, with two types: the old and the large. In 1985 the Žemaičiai breed was called Large Žemaitukai. In 1963-1965 stallions from northern Sweden were brought in to improve the Large Žemaitukai horses. Colours of the latter range from yellowish to dark bay or black. The Large Žemaitukai were bred by the linear breeding method; consolidation of this type of horses was not fully completed. The Large Žemaitukai started appearing in herd books in 1948 as a local horse breed. The first state herd book on Žemaičiai horse breed was published in 1959, and was being issued up to 1996. Since 2001, the large Žemaitukai herd books have been handled by the Lithuanian Horse Breeders Association. As there is no unified identification system for Large Žemaitukai horses at the moment, thoroughbred horses are identified according to their colour and markings. These horses are used for farming and driving. In Lithuania labour horses were first tested for strength in 1857. The training and capacity testing of large Žemaitukai following unified methods were performed during the period of 1954-1985. Since 2002 the Lithuanian Horse Breeders Association has been responsible for the above testing.

Since 1990 the population of thoroughbred Large Žemaitukai horses has been decreasing in a major way, and now has come close to extinction.

The **Lithuanian Heavy Draught** horse breed started evolving in the late XIX century. This task was undertaken by the Society for Breeding Work and Driving Horses in 1894; the society increased import of Brabanson, Perscheron, Arden and other heavy thoroughbred stallions that were interbred with local mares. In 1923 heavy horses from Holland were imported with the aim to compensate thoroughbred material destroyed during the war. In 1925 the Ardens were brought in from Sweden. The bred hybrids were much more vital, developed faster, and the important, better adapted to the local conditions than imported horses. Such hybrids in the south-western part of Lithuania determined further development of heavy type of horses. Purposeful breeding activity, proper feeding and keeping created favourable conditions for the development of a breed that was confirmed as an independent one with 12 lines in 1963. Lithuanian Heavy horses are crossed with the Arden stallions brought from Sweden in 1963, 2000, and 2001. Lithuanian Heavy horses have been included into herd books as Arden breed horses and hybrids. The second herd book of Lithuanian heavy horses was issued in 1951-1996. Herd books for Lithuanian Heavy horses are issued by the Lithuanian Horse Breeders Association. Thoroughbred horses are identified by colour and markings. In the first place, Lithuanian Heavy horses are used as working force, but now more and more of them are exported abroad for meat. The middle of the XIX century marked the start of labour horse capacity testing; in Lithuania, the first were done in 1857. Since 2002, the Lithuanian Horse Breeders Association has been responsible for Heavy horse testing. At the moment there is a tendency for rapid decrease of the Lithuanian Draught Heavy horse population: the number of stallion lines has diminished dramatically, while breeding and working qualities are getting worse. Individual breeders of Draught Heavy horses in Lithuania actually are only concerned with the improvement of their own herds. The current status of Lithuanian Heavy Draught horse breed can be seen as close to extinction.



In the mid-XX c., the **Lithuanian Black-Headed** sheep breed was created through crossing local coarse sheep with woolen English Shropshire and meaty German black-headed rams. Having inherited good wool and meat characteristics, these sheep are rather meaty, have short maturing period, and supply homogenous semi-fine fleeced wool. The sheep have short and white wool, while their head, ears, and legs are covered with black hair. This type of sheep has no horns. According to productivity trend, Lithuanian black-

headed sheep belong to the group of semi-fine fleeced and short wool sheep of meat-wool type.



In order to form productive herds of thoroughbred sheep, state Black-Headed sheep breeding nucleus farms were established in Pasvalis in 1952, and Telšiai in 1956. The aim of breeding nucleus farms is to improve this breed and increase the number of sheep. In 1958 the Ministry of Agriculture issued an order confirming sheep breeding farms; however, in 1961 the decreasing number of sheep caused decline in the amount of farms as well. In 1963 Šeduva Experimental Farm (now state enterprise 'Šeduvos

avininkystė') was set up with the aim to preserve the Black-Headed sheep breed. From the very start, the farm launched individual sheep breeding and productivity control, and also performed scientific research. The results included thorough evaluation of sheep constitution and exterior, reproductive qualities, milking capacity of lamb-giving sheep, chemical composition of milk, and quality of wool and meat.

Šeduva sheep breeding farm as well as breeding farms marked sheep by ear cuttings or badges hung on the neck. Meanwhile unified and general marking of Lithuanian sheep started. The best sheep and thoroughbred rams are included into herd books. The first Lithuanian Black-Headed breed herd book was issued in 1963, and the last (13<sup>th</sup>) – in 1993.

At the moment thoroughbred Lithuanian Black-Headed sheep are raised in four farming herds (about 70 ewes) and the only sheep breeding nucleus farm, Šeduvos avininkystė' (about 400 ewes). They preserve the genetic stock of Lithuanian Black-Headed sheep, control productivity, make up sheep breeding plans, and raise productive thoroughbred young sheep for farmers. About 140 doses of frozen semen from Black-Headed rams are stored at the Animal Reproduction Department of Lithuanian Institute of Animal Science.

The state enterprise 'Šeduvos avininkystė' is responsible for the preservation of the genetic stock of Lithuanian Black-Headed sheep, while the Lithuanian Sheep Breeders Association takes care about the herd books.

In the late XIX c. – early XX c. the most popular sheep breed was Lithuanian local **Coarse wool sheep**, a breed of low productivity and long maturing period yet having small demands. There were a few types of them: Pomeranian, Polish long-tailed, thin-tailed (*ovis leptura*), and Northern short-tailed (*ovis brachynarė borealis*). Long-tailed sheep, mostly found in Suvalkija, mainly had white covering hair, while sheep and most of rams were hornless, while Northern short-tailed, found more often in Vilnius province, had dark, sometimes even black wool. Their head and leg colour could be different, most of rams had horns. Quite often sheep also had horns; they were thinner than long- and thin-tailed sheep.



The crossbreeding process between the above coarse sheep types gradually made the differences smaller, and in most cases created sheep had mixed features. One sheep could yield 1-1.5 kg of grey, white, brownish, or black wool. Sheep weighed 30-40 kg each, and brought forth 2-3 lambs. According to productivity trend, these are meat-wool type sheep with little flesh and no accumulated fat, with exceptional off-season heat period.



In 1995 the Lithuanian Institute of Animal Science started forming a herd of local, almost extinct, Coarse wool sheep. At the moment there are 38 sheep with their productivity factors checked: exterior, weight, also reproductive, milk, wool, and meat qualities. The major aim is to form a local sheep herd of non-related and most typical sheep with the intention to preserve, use and spread the genetic stock of this breed. So far sheep have been crossed naturally according to the breeding plan. In 1999 this herd was recognized thoroughbred.

In Lithuania the unified sheep marking started in late 2001, and included the remaining local Coarse wool sheep. There are about 100 of the latter (38 at the Lithuanian Institute of Animal Science, 15 at Kaunas Zoological Gardens, 10 at Folk Homestead Museum in Rumšiškės, 30 at farmers farm). Unfortunately, they were never included into herd books. Today the Lithuanian Sheep Breeders Association is taking care about herd books; local sheep will be registered in the future as well. So far the status of local sheep should be considered critical-supportive with stable minimal number of sheep.



Historical sources mention that as far back as about 1500 B.C., people located in the territory of Lithuania were raising goats. However, no numbers are given. According to the XVI c. estate inventory papers, goats made up 6 per cent of the total number of estate domestic animals.

Lithuanian **local milky goats** could have descended from Siberian

mountain goat, and later – Russian milky goats spread from Saint Petersburg, Moscow, Ivanov, Yaroslavl, and other regions.

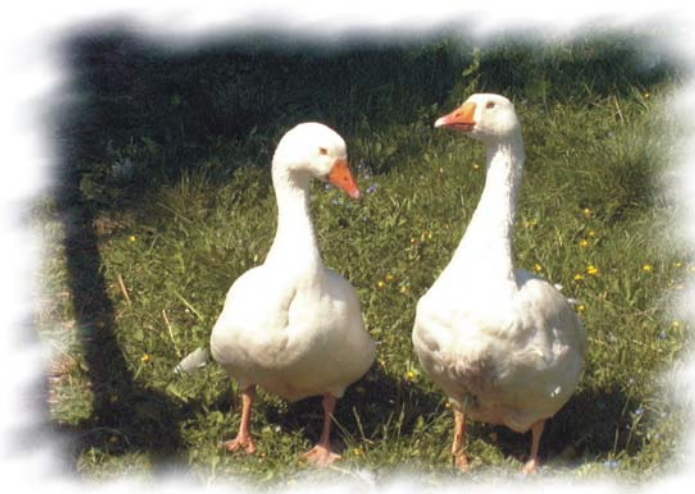
Lithuanian local goats weigh 35-45 kg, their body is covered with long coarse hair, often they have a beard and 'earrings', and bigger or smaller horn. Possible colours are black, white, grey, brownish, and motley. Goats give forth 2-3 kids, produce 1-3 kg milk, are hardy and not demanding, and adjust themselves easily to keeping conditions. Such goats can still be found in more remote homesteads.

Since 1990 the number of goats in Lithuania has been increasing; at the same time, import of goats and improvement of local ones has started. This is threatening the existence of the local breed. Today improved local goats, raised in five thoroughbred herds, are prevailing. The goat productivity has been controlled since 1992 by the state enterprises 'Cattle Productivity Control' and 'Milk Testing'. In 2002 the number of controlled goats amounted to 510 local ones.

The unified marking of goats, started in 2001, has not yet been completed. No herd books are available, but later they will be handled by the recognized goat breeding institution, Lithuanian Goat Breeders Association. Thoroughbred goat herds have breeding plans.

The current status of local herds can be considered arguably stable, oriented to milk capacity increasing. The Lithuanian Goat Breeders Association in co-operation with scientific researchers is preparing breed conservation and development plan.

**Vishtines geese** were created by crossing ancient local geese with East Prussian domestic, Emden, and partly Pomeranian breed geese in the first half of the XX century. There were two local selected goose breeds: vishtines geese and flock geese; however, during the Soviet period goose breeding was in decline, which led to extinction of local breeds. As a more promising variety, vishtines geese were included into the USSR water bird collection still kept near Moscow, and stayed a part of it until 1995. One hundred eggs from this collection was taken to Lithuania, and that enabled to recreate the population of vishtines geese. Lithuanian flock geese died out as a breed.



Vishtines geese are white and universal in terms of productivity: they are suitable for the production of down, meat and liver. During the process of shedding feathers, geese can be plucked while still alive. Geese are not identified individually, there is no herd



books, and there is no action plan so far; productivity control is used for goose flocks only. The Lithuanian Institute of Animal Science takes care about the recreation and preservation of the vishtines goose population: 120 goose flocks of three different age groups are kept at the Institute. These flocks are used for the reproduction of vishtines goose population. Even though about 600 goslings are distributed to farmers every year, no new reproductive flocks could be formed, thus the breed is considered critical-supportive.

#### **4. The changing need for the domestic animal genetic resources**

After the re-establishment of the independence, the structure of Lithuanian farms changed a lot, while the land reform created beneficial conditions to develop private farms. Today it is possible to classify the Lithuanian farms into 3 types: agricultural associations (also produce agricultural products), family farms and house farms. In comparison to the EU countries, Lithuanian farms are small and weakly specialized. Shake-up of the farms and investment related to the innovative production technologies would allow to increase the total efficiency of the agricultural production.

The primary production systems are related to each other and are dependent from each other. Domestic animal breeders a part of the feedstuffs are growing by themselves, another part are buying. They also buy pedigree animals from the pedigree stations or pedigree flocks. The changes in the price level influence the number on animals kept therefore have big influence on the animal production itself. The poultry sector is very much dependent from the incomes that are coming from outside, because they are dependent on the foreign pedigree material. In the animal husbandry there are no factors that would be of high risk. The main factors would be: unstable prices for the procurement of the animal production, not stable and not sufficient help from the State, not clear prices of the intervention procurement, dry or rainy year.

The milk production is the main income source in the farms. Therefore the dairy cattle is an important economical branch and fulfills also the sociological needs. For the countryside inhabitants it is the main food (living) source and also the working object.

Taking into account the environmental conditions, the market of the animal husbandry products, it is advisable to develop dairy cattle, in some regions beef cattle and pig breeding. Beef cattle's breeding is obtaining more and more attention. It might be due to the prospective support programs from the EU countries and due to the alternative animal husbandry systems in the low-input landscapes. According to the old traditions, the beef cattle breeding was not popular in Lithuania, but lately, due to the State support in buying beef type heifers from abroad, the beef cattle number have been increasing. In the strategy it is foreseen that the beef cattle breeding will be one of the priorities in the Lithuanian agricultural sector. The development of this branch will help for the animal breeders to integrate into the EU market and supply the beef meat of high quality that would be

competitive in the market. In addition to that the sheep husbandry is getting more importance. Lately there is increasing demand for the lamb meat, but that what is offered does not fulfill the market needs (due to small amount of sheep kept). In the near future there is a need to increase the number of meat type sheep and to improve local sheep meat traits. The high interest in sheep breeding is thought to be due to the alternative animal husbandry in the low-input landscapes and due to the increasing demand for the lamb meat.

Horse breeding is importance in the Lithuanian agriculture and in the public life. Due to the change from the working horses to the sport horses and horses used in the tourism, the traditional agricultural branch related with horse breeding becomes more specified and creates new working places on the countryside. The working horse breeding is reorganized into the meat horse breeding. The increasing interest in horse breeding influence the development of new horse keeping, feed supply, training ant other technologies. The preservation

of Lithuanian horse genetic resources is important for horse breed management.

Different markets and differences in the need for animal production within the country influence use of different domestic animal genetic resources.



Large influence to the changes of type and assortment of products had opening of markets with specific demands, competition from foreign market, new breeds and production technologies coming from outside the country. The decreased demand for native animal breeds and not enough support to local animal breed keepers rapidly diminished number of animals in populations.

At the moment there is a tendency of increased interest in local animal breeds in recreation places, ecological farms and country tourism places because of their undemanding management, quite temper, good fertility and health characteristics, ethno historical value and nice look.

## 5. Conservation of Lithuanian domestic animal genetic resources

Some old Lithuanian domestic animal and poultry breeds are extinct, while some other breeds like Žemaitukai horse, Native pig, White Back and Light Grey cattle, Coarse woolled sheep, Vishtines gees were close to extinction, because that after the first world war these breeds were crossed with more productive breeds. Although in 1921 the commission, created in the Agricultural ministry suggested to form flocks of local breeds and breed them pure, only Žemaitukai horse stud was created, lost later during the Second World War.

After the 2<sup>nd</sup> world war the number of animals belonging to the local native breeds was still big, but the use of insemination in the animal husbandry caused the decrease in the number of local cattle. Also the number of Native pigs decreased, while the highest quality was given to the White pig breed, while the local pigs had colored skin. After the fall in gees breeding, Lithuanian gees breeds disappeared as well.

The preservation of local breeds became important after the re-establishment of independence. In 1993 the search, collection and establishment of small populations with pedigree information was started.

Lithuanian local Žemaitukai horse, Lithuanian Native pig, White Back and Light Grey cattle, Coarse woolled sheep, Vishtines gees were identified as unique breeds that have to be preserved on the national and international level. They are included into the World Watch List, FAO, Rome 2000. The need for the preservation should be identified also for some modern Lithuanian cattle breeds that have economical value but due to the crossbreeding became at the risk of extinction. These breeds are: old Danish type Lithuanian Red and Dutch type Lithuanian Black and White cattle breeds and Lithuanian White pig breed.

The Lithuanian old domestic animal breeds are at critical supportive status. In the conservation schemes in-situ and ex-situ methods are used. The small populations of the old local breeds are created. The pedigree structure is recorded. The state gives a minimum support to keep these herds.

The technology for preservation of frozen cattle semen is used already long ago in Lithuania. Light Grey, White Back, Black and White and Red cattle bull semen samples are stored in the artificial insemination stations. The preservation of stallion and ram sperm was started also. The technology for preservation of frozen embryos is introduced in Lithuania, but this technology is not used for preservation of genetic diversity. The genetic material – DNA is preserved in the “Lithuanian domestic animal gene bank”.

The old native Lithuanian domestic animal breeds were not much investigated, therefore after the extinction of these breeds was stopped, phenotypic biochemical and molecular markers were used in order to investigate biological-economical characteristics and genetic diversity of these breeds. In Lithuania there is a state research program “Evaluation and preservation of Lithuanian plant and domestic animal genetic resources” carried out. For each breed the reproduction, exterior characteristics, growth and maturation speed, milk yield and milk composition, genetic polymorphism of blood groups, horse, cattle

and sheep breed evaluation using microsatellite markers, evaluation of pig, sheep, geese carcass quality and succulence, meat chemical composition, biological value and quality, cranial investigations are performed.

Lithuania takes part in some international projects in order to find out the genetic uniqueness of Lithuanian domestic animal breeds and their location among other European and World domestic animal breeds.

Together with Nordic, Latvian, Estonian and Polish researchers, Lithuania collaborates in the international projects "Analysis and Comparison of Genetic Diversity in Cattle Breeds of the Northern European Area (N-EURO-CAD)" <http://www.neurocad.lva.lt> and "Origin and diversity of North European sheep breeds" <http://www.rala.is/beta>. Lithuania also participates in the project "Molecular genetic characterization of cattle and sheep genetic resources for maintaining future animal breeding options-SUNARE".

The obtained results are used to prepare regional and country programs for conservation and sustainable use of different breeds.

## 6. The national capacity and priorities for the use and conservation of Lithuanian domestic animal genetic resources

The preservation and sustainable use of domestic animal genetic resources is outlined in the Convention on Biological Diversity, signed by Lithuania in 1992 and verified in the Parliament, Animal Husbandry law. In 1997 the "Conservation program of native Lithuanian domestic animal genetic resources" was prepared.

Today in Lithuania are prepared the "Law for use and preservation of Lithuanian national domestic animal genetic resources" and the "Program for use and preservation of Lithuanian national domestic animal genetic resources".

In the use and preservation of Lithuanian domestic animal genetic resources different institutions are participating.

**Ministry of Agriculture of Lithuania** – 1995 year the board for the coordination of the domestic animal genetic resources was established. This board is built from the representatives from the Agricultural Ministry, research and education institutions, associations and agricultural chamber. The board is coordinating the preservation, management of genetic resources as well as the education and international collaboration. The work of the board is voluntary.

In the Agricultural Ministry the State Animal Breeding Program until the year 2005 is verified. The financial resources are used for the improvement of the breeds and for the preservation of the local breeds treated with the extinction. There are subsidies paid for the owners of Lithuanian Light Grey and Lithuanian White Back cattle. Subsidies are paid also

for the Lithuanian Native and Lithuanian White pigs, Coarse woolled and Blackface sheep, Žemaitukai horse, Large Žemaitukai horse, Lithuanian Heavy Draught horse, Vishtines gees, kept in the collection herds.

The financial resources for the evaluation of the domestic animal genetic resources are obtained from the programs, financed through the LR Science academy, Ministry of Agriculture of Lithuania, and different international foundations.

**Research and educational institutions** – Lithuanian Veterinary Academy and Lithuanian Institute of Animal Science maintain and breed the native domestic animal breeds, treated with the extinction.

In the Lithuanian Veterinary Academy is created the “Lithuanian domestic animal gene bank”. In this bank DNA samples of different domestic animal breeds are kept. In the Lithuanian Veterinary Academy the within-breed and between-breed genetic variation using biochemical and molecular markers, breed evolution and domestication processes in the frame of Lithuanian-Baltic-Nordic region is performed.

In the Lithuanian Institute of Animal Science the biological-economic characteristics of different breeds are evaluated, the genetic analysis, sperm and embryo freezing technologies are improved. Also the management and monitoring of domestic animal breeds as well as the preparation of preservation programs are performed.

Research and educational institutions perform the active educational work by preparing the books, articles, booklets, posters, lectures, by organizing seminars and conferences, taking part in the radio discussions.

**Animal breeder associations** – over 10 in Lithuania. Actively solve the questions related with breed improvement and use, but are almost not involved in the breed preservation programs. Old Lithuanian domestic animal breeds, with the exception of the Žemaitukai horse, don't have associations. The care of these breeds is taken by the institutions that have the collection herds and by the coordination board of the domestic animal genetic resources.

In the preservation and sustainable management work Lithuania collaborates with different international organizations: Nordic Gene Bank, Food and Agricultural Organization, European Regional Focal Point, European Association for Animal Production.

Domestic animal genetic resources that were created in Lithuania have the selection, economic, scientific, ecological, cultural, historical value for Lithuania and is an important part of the global domestic animal genetic resources.

National priorities of Lithuania are:

- Implement strategy for “Sustainable use and conservation of AnGR”
- Create legal framework for sustainable use and conservation of AnGR
- Establish effective monitoring and conservation system of AnGR
- Integrate native vanishing domestic animal breeds that are under ex-situ conservation into active and sustainable production systems
- Develop and use biotechnological methods for evaluation, better use and conservation of AnGR. Establish Lithuanian AnGR Cryobank

- Improve continuing education of farmers and dissemination of information about AnGR
- International cooperation and network building in country



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