
Breeder associations, milk recording and identification of cattle and sheep in the Czech Republic

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Total area	78 886 km ²
Population	10 304 300
Population density	131 inhabitants/km ²
Number of Regions	14
Distance (in km) from Prague to:	Paris – 880, London – 1 160, Stockholm – 1 050, Moscow - 1 670, Bucharest – 1 080, Rome - 920

Main features of the Czech Republic

Table 1. Gross agricultural product – current prices (bill. EURO).

Year	1998
GAP	2.13
GAP as % of GDP	4.3
Number employed in agric (primary Production)	1989 – 533 100 1995 – 221 600 1998 – 206 000
Number employed in processing	156 000

Introduction

Table 2. Main sectors in agriculture.

Item	Output 1998 (bill. EURO)	1998 (mil t.)
Cereals	0.386	6.669
Potatoes	0.075	1.512
Oilcrops	0.111	0.779
Fruits	0.044	0.371
Hops	0.014	0.0007
Sugar beet	0.044	3.479
Beef	0.183	0.247
Milk	0.339	2.716
Pigs	0.372	0.714
Poultry	0.119	0.240
Eggs	0.094	3.615 (mil. pcs)
Gross agricultural production	2.147	-

Table 3. Farm structure (use of agricultural land) by type and size (1998).

Category	Number of entities	'000 ha	%	Average size of holding (ha)
Physical persons *	32 365	850	23.7	26
Legal persons	2 146	1 452	40.6	677
Cooperatives	875	1 235	34.5	1 411
Others			1.2	

*Registered as farmers.

Table 4. Structure of size of the agricultural farms (1998).

Size of farms	Number of farms		Land	
	Total	%	Ha	%
- 10 ha	12 812	49.4	64 044	1.8
11- 50 ha	8 271	31.9	182 548	5.1
51- 100 ha	1 320	5.1	92 556	2.6
101 – 500 ha	1 575	6.1	369 812	10.3
500- 1000 ha	762	2.9	566 325	15.8
1001- 2000 ha	781	3.0	1 108 973	31.0
Over 2000 ha	403	1.6	1 196 850	33.4
Total	25 924		3 580 850*	

*total is less than total agricultural land due to exclusion of family gardens.

Table 5. Dairy/Cattle Sector.

Item	1989	1995	1999
Total Cattle numbers ('000)		2 030	1 503
Number of cows (million cows)	1 248	768	590
Total milk output (million l)	4 900	3 031	2 717
Total beef production ('000 tonnes lw)	518	322	246

Table 6. Pig sector.

Item	1989	1995	1999
Number of pigs ('000 heads)	4 685	3 867	4 001
Sows	312	295	312*
Pigs/sow/year			20
Gain (kg/day/pig)	0.63	0.62	0.64*
Pig meat production ('000 t/year liveweight)	778	650	669*

*1998 data.

Table 7. Number of farms and stables in the performance recording.

Year	Number of farms	Number of recorded cows total	Number of cows/farm	Number of recorded stables	Number of cows/stable
1994	3 649	741 033	203	10 497	71
1996	3 121	607 659	195	6 340	96
1998	2 743	524 780	191	5 213	101
1999	2 621	501 705	191	4 656	107
Difference ¹⁾	-122	-23 075	0	-557	+6

¹⁾difference between 1999 and 1998.

Table 8. Development of breeding structure of milk recorded cows since 1990.

Breed	1990	Cow numbers in			Index to year 1990
		1995	1998	1999	
Cows in total	1 221 749	667 973	526 779	501 705	41.1
From which					
Czech Red Pied	637 392	369 289	280 053	262 140	41.1
Black and White	500 767	251 150	236 656	229 389	45.8
Others	83 590	47 534	10 070	10 176	11.9

Table 9. Proportional representation of farms and stables according to the number of recorded cows in 1999.

Number of cows in a stable	Farms (2 621)		Stables (4 656)		
	farms (%)	stables/farm	proportion of cows (%)	stables (%)	proportion of cows (%)
1 - 10	10.2	1.0	0.3	9.8	0.4
11 - 30	14.7	1.0	1.4	10.4	1.7
31 - 50	7.8	1.0	1.6	7.0	2.5
51 - 100	15.2	1.1	5.9	32.4	22.4
101 - 150	8.6	1.2	5.5	15.0	15.9
151 - 200	9.1	1.5	8.2	11.3	16.9
201 - 300	10.7	1.8	13.4	6.9	14.5
301 - 400	8.3	2.2	14.8	4.3	12.8
401 - 500	5.5	2.7	12.6	1.9	7.5
and 500	9.9	4.3	36.3	1.0	5.4
Totally	100.0	1.8	100.0	100.0	100.0

Agricultural production represents 4.3 percent of GDP in the Czech Republic. Production is oriented at growing grain crops, oil bearing crops and potatoes. Animal production is focused on milk and meat (beef, pork and poultry) production. Legal persons (agricultural cooperatives, joint stock companies, etc.) manage 75 percent while private farmers manage 23.7 percent of the agricultural land. There are less than 10 percent of farms of a size up to 100 ha of land, on the other hand, enterprises managing more than 1 000 ha represent more than 64 percent.

The number of milk recorded cows was 501 000 in 1999, which is 41 percent of the number in 1990. The total number of cattle was reduced similarly. Gradually the size of milk recorded herds increased; in 1994 there were 71 cows in one recorded herd, in 1999 more than 100 (107 cows).

Breeder associations

Breeder associations were established in 1990 as non-profit organizations. These organizations are responsible for:

- running herd books and issuing pedigree certificates;
- coordination and methodological leading of breeding programmes;
- determination of selection criteria;
- coordination of breeding bull testing;
- advisory service for their members;
- organization of exhibitions;
- international cooperation.

There are the following breeder associations in the Czech Republic:

- Association of Czech Spotted Cattle Breeders
- Association of Black and White Cattle Breeders
- Association of Beef Cattle Breeders.

The Czech-Moravian Breeders' Corporation (CMBC) was established by privatisation of the State Breeding Enterprise in 1996. The corporation was transformed to a joint stock company in 2000. The Corporation is owned by the Association of Black and White Cattle Breeders in the Czech Republic (45 percent), the Association of Czech Fleckvieh Breeders (45 percent) and the Breeders' Union. The main aim of the Corporation is to ensure the following activities:

- Running the national system of milk recording and artificial insemination including data processing, complementation of the database and providing breeders and AI stations with output data sets.
- The Corporation was authorised by the Ministry of Agriculture of the Czech Republic to run the system of central identification and registration of cattle according to requirements of the Council Decision of the European Communities No. 820/97. The computer programme was modified and the processing was started including the distribution of eartags and animal movement recording.

The database of imported animals was complemented and the work on the methodology of a centrally operated testing programme was initiated. Issuing of pedigree certificates of breeding bulls was started and the system of recording and issuing of embryo pedigree certificates was developed.

- The Corporation is responsible for the calculation of breeding values in Black and White and Czech Fleckvieh breeds. In 1998 the Animal Model used in calculation of breeding values for milk was modified. As is common in most countries, second and third lactations of cows are incorporated into the calculation.
- The single trait Animal Model without repeating was developed to estimate breeding values of bulls for type traits. In this model each type trait is evaluated by separate calculation.

Data transfer via internet between laboratories and a central computer was initiated. The laboratories extended their analytical activities by means of regular determination of urea contents. Laboratories analysed a total of 4.5 million milk samples. More than 90 percent of the samples were analysed for purposes of milk recording (for fat, protein and lactose contents). The cell count was determined at 2.1 million samples.

Czech-Moravian Breeders' Corporation. Hradištko pod Medníkem

Central recording

Herd book running

Genetic evaluation data processing

Milk recording and laboratories for milk analysis

Immunological laboratory

The immunological laboratory provides pedigree verification of cattle, horses, pigs, sheep, goats and dogs using the standard technology (blood types). The usage of DNA technology has already been started and is used increasingly more frequently. The genetic traits BLAD, CAS, RED in cattle and MHS in pigs are determined by this technology.

Local breeding service centres

Centres in cooperation with associations of breeders and local agrar chambers provide extension services for breeders. They are responsible for checking the accurate identification of animals according to EU regulations and the observance of herd books and ICAR rules.

Artificial insemination stations were privatised through coupon privatisation. At present, there are eight joint-stock companies in the Czech Republic keeping breeding bulls, producing semen and providing AI services. They are mutually competitive. Some of these companies are co-owned by farmers.

Milk recording

Performance recording was introduced in the Czech Republic in 1905. Since 1994 the Czech Republic has been a member of ICAR and INTERBULL. The member organization representing our country is the Czech-Moravian Breeders' Corporation, JSC. Since 1996 the Czech Republic has been authorised to use the ICAR stamp.

In the Czech Republic 91 percent of all cows are milk recorded. Globally it ranks the country among the ones with the highest proportion of milk recorded cows. In harmony with the standard ISO 1546 from 1991, two primary methods (A and B) of milk recording are utilised. The recording **method A** is executed by an authorised person (control assistant). In accordance with the determined methods the amount of milk is recorded and samples either from each milking during the control day (A_4) or alternately from morning and evening milking each month (A_T) are collected.

The interval between two control days must be from 24 to 36 days in A_4 . However, the average interval during the year must be from 28 to 30 days.

The recording **method B** is carried out by a breeder. In the last five years the proportion of cows recorded using the method A_4 increased at the expense of the method A_T . The number of cows under the method B is negligible.

Annual costs of milk recording are similar to the purchase price of 40 kg milk. Seventy-five percent of milk recording costs are paid by a breeder. The State subsidises the recording to a maximum of 25 percent.

Table 10. Extent of milk recording in Czech Republic.

Year	Number of cows		Milk recorded		Method of milk recording (% cows)			
	total	milked	cows	%	A ₄	A _T	B	total
1994	829 729	829 729	741 033	93.4	94.7		5.3	100
1996	750 593	712 000	607 659	94.8	94.8	11.5	0.1	100
1998	646 838	598 000	524 780	92.4	92.4	8.5	0.1	100
1999	642 026	583 000	501 705	90.8	90.8	6.1	0.1	100
Diff. ¹⁾	-4 812	-15 000	-23 075	-1.6	-1.6	-2.4	0.0	x

¹⁾difference between 1999 and 1998.

There are two milk analysing laboratories in the Czech Republic (each of them has several more branches). The laboratories are equipped with Bentley and Somacount instruments. Samples are analysed to determine the content of fat, protein and lactose and at least at the request of a breeder, the somatic cell count and urea as well. At present, the somatic cell count is determined in 45 percent of all samples.

In the Research Institute of Cattle Breeding in Rapotín, there is a reference laboratory involved in the international circle tests organized by the CECALAIT laboratory in Paris. All the national laboratories are then involved in the national circle tests and calibration through the reference laboratory.

Table 11. Milk recording results for individual breeds in the control year 1998/99.

Breed	Number of compl. lactations	Lactation days	Milk (kg)	Fat %	Fat kg	Protein %	Protein kg	Calving interval
<i>Black and White (H100)</i>								
1999	81 366	297	6 303	4.18	263	3.31	209	410
1998	69 742	296	5 851	4.23	247	3.26	190	412
<i>Black and White including crosses from grading up crossing</i>								
1999	158 773	296	6 124	4.20	257	3.32	203	404
1998	144 439	295	5 648	4.26	140	3.27	184	407
<i>Czech Spotted totally</i>								
1999	228 892	292	5 098	4.35	222	3.41	174	394
1998	222 632	292	4 774	4.35	208	3.37	161	397
<i>Other breeds totally</i>								
Montbel.	1 244	294	6 432	4.12	265	3.46	222	406
Ayrshire	396	297	5 249	3.39	230	3.28	172	421
Jersey	323	296	4 959	6.44	319	4.07	202	392
<i>Milk recorded cows totally</i>								
1999	428 942	294	5 478	4.29	235	3.38	185	398
1998	409 531	293	5 079	4.32	219	3.33	169	400

Animal identification and registration

Cattle identification by means of eartags was introduced in the Czech Republic in the 1960s, therefore, it has now been used for about 40 years. This kind of identification was, however, obligatory only for inseminated cows. At that time the animals were identified not immediately after birth but the heifer was tagged only at the first insemination. Later in the 1980s all the calves from milk recorded cows (approximately 95 percent of all cows) were required to be identified. However, in reality only heifers and not bulls were always tagged.

At present, it is compulsory to identify each animal by an eartag within 72 hours after birth. For a number of years, all the cows from milk recorded cows have been identified by two eartags. One plastic and one metal tag are used in the Czech Republic. The plastic tag is inscribed using the laser so that the inscription is impossible to wipe away. Earlier the number was of six digits but several years ago it was changed to nine digits so that no number is repeated for at least 200 years. In the last four years, the plastic tag has also included, in harmony with EU requirements, the country's abbreviation CZ and the logo CMSCH (Czech-Moravian Breeders' Corporation).

The eartag (code of animal) consists of:

- abbreviation of country – CZ;
- six digits of a serial number of the animal within the district where it was born;
- three digits encoding the district.

It is also possible to identify the sex of the animal from the code of district.

The required identification system was introduced in the Czech Republic at the end of 1998. At present, about 15 000 breeders and more than 1 200 000 animals, i.e. more than 75 percent of all animals are registered in this system. The whole cattle population should be involved by the end of 2000.

Electronic identification will not be introduced in the near future because of its high costs. Data collection is usually carried out by mail. Afterwards the data are centrally analysed. Most enterprises send their data as a data file on a diskette. Some of them have started to send them via Internet.

For each animal an “accompanying document of animal” is issued. This document accompanies the animal for the rest of its life and all whereabouts of the animal are entered into it. All insemination are also recorded here. Using the central computer, data on date of birth, breed of animal, sire, dam and dam's sire are filled in the document. The pedigree of animal is put together based on AI and milk recording data.

Similar systems, although a little simplified, are being developed for other species as well. In 2000 they will be introduced for sheep and goats and in the second half of 2001 the registration of pigs will be commenced.