

When a dairy farmer becomes a manager

Ing. Josef Diviš, Selektá Pacov, a.s.

Dr. Jiří Motyčka, Holstein Cattle Breeders' Association



Introduction

Many changes continue to occur in the dairy industry. The total number of cows decreases while the production and the herd size increase. The farmer's position is also changing, especially within large dairy herds. There are new ecological constraints, the price of land and labour costs are growing, but at the same time there is a considerable pressure on the reduction of milk price. Farmers are seeking ways of reducing their total milk production costs. Consumers require quality and healthy food which can only be produced by healthy animals.

A dairy farmer becomes a manager

Major changes are currently occurring in dairy cow operations. There is an obvious tendency towards increasing the size of herds. Over the last decade, the average herd size has increased to 154 cows; in Holstein herds it is 187 cows. At the same time, totally 58 % of dairy herds disappeared.

Table 1: Changes in the number and the average size of performance recorded dairy herds in the CR

	2006	2001	1996
Number of herds	2642	4226	6308
Average number of cows per herd	154	114	96

A system approach to everyday animal care routines is required for the management of large dairy herds that are common in Hungary, eastern Germany, Slovakia, and the CR. Different activities related to dairy cow care during the calving interval are performed regularly on a specific day of the week in a particular group of animals. Herds are often managed by skilled employees with a university degree who are able to evaluate available information and use them efficiently. Animal care routines including milking are performed by employees with different levels of education and qualification. It is supposed that the tendency towards increasing the herd size will continue also in other countries as dairy farmers are generally facing the necessity to reduce milk production costs, utilize new technology and machinery, and to seek for appropriate labour power.

In case of large-size herds a dairy farmer becomes a manager who needs high-quality services and all information available to make qualified management decisions. He is interested in independent and objective information as every management mistake related to a large herd means a huge financial loss.

The relationship between a dairy farmer and AI companies

The market with insemination units has been open for more than 10 years in the CR. AI stations were privatized and are not owned by farmers. Fusions and acquisitions are taking place and foreign investors enter the AI companies.

The farmers are not connected with a particular AI company. The relationship between a farmer and the AI company is mostly based on commercial principles. Every year a contract is made on

purchase of bulls, insemination, and other services. Many farmers are even satisfied with a verbal agreement. Some co-operate with only one company which supplies all the insemination units needed. Holstein farmers often co-operate with more than one AI companies. Some farmers have containers of their own, they themselves buy semen and inseminate their cows, or they use services of an insemination technician.

The relationship between a dairy farmer and AI companies are relatively loose and businesslike. In 2006, semen of Black and White bulls was used for 567 thousand inseminations. Of them, young bulls were used in 21 % (116 thousand AI units), bulls proven in the CR in 35 % (199 thousand AI units), and bulls proven in abroad in 43 % (242 thousand AI units). The proportion of imported AI units from bulls proven in abroad is rather high with the greatest share taken by the bulls from the United States and the Netherlands.

Table 2: Number of inseminations by bulls proven in different countries in 2006

Country of origin	Black and White			Red		
	Bulls	Total AI	%	Bulls	Total AI	%
Czech Republic	245	199 228	45.2	13	4 187	9.3
USA	196	106 112	24.1			
Netherlands	71	57 835	13.1	27	25 415	56.4
Canada	46	19 574	4.4			
France	47	20 281	4.6			
Germany	62	21 627	4.9	29	14 224	31.6
Italy	20	9 226	2.1			
Others	24	7 100	1.6	7	1 198	2.7
Total	711	440 983	100.0	76	45 024	100.0

Information on animals

Proper information on animals is necessary to make good decisions. In the CR, the data from the performance recording system and artificial insemination are processed and the breeding values are estimated by the organization co-owned by different breeding associations and the state. This organization in collaboration with the Association of Holstein Breeders provides farmers essential information via mail or e-mail. Up to date information on breeding values of bulls and the best cows are freely accessible on the Internet without any limitations or charges.

Information on herd and population

Farmers may use information necessary to evaluate herd quality, determine selection criteria, and compare the development of the herd with the development in the population. A quarterly summary of phenotype and breeding values for all production and type traits (averages and standard deviations) is produced for each herd. The herd is also classified into groups according to the breeding values for kg of protein ($x \pm 0.5, 1.0, 1.5, 2.0$ s), reproduction results and predicted breeding values of progeny. In addition, farmers may receive the lists with complete results of individual animals from the data processing centre via the Internet or they can use the services of AI companies having the necessary herd analysis software.

Information on bulls

The results from the international evaluation of production, type, somatic cell count (udder health) and fertility traits are available for the farmers. The values for longevity and calving difficulty will be available in 2008.

Besides the results given in catalogues, the information available on the Internet is used more and more frequently. The website of the Association contains the browser of bulls with their national breeding values and the international evaluation Interbull browser. The calculation of national breeding values is time harmonised with the Interbull. All the results have been so far published four times a year. Two data files of all bulls listed according to the national and international evaluation for analyses and calculations of own indexes are also available.

In the international evaluation browser there are breeding values calculated on the bases of the CR, the United States and the Netherlands or any other country with the highest number of daughters. It is quite common that after receiving the catalogue from the AI company or semen importer the farmer will check the data with help of the Association's website.

Breeding goal and selection index

Breeding goals in Holstein countries are getting increasingly similar. All farmers prefer cows with outstanding milk production, good milk components, fertile, healthy, and not requiring any special care. Increasing of the herd size will lead to even further similarities between the breeding goals. With respect to the coming termination of milk quotas in Europe, the differences between the breeding goals in America and Europe are expected to be further reduced.

Selection indexes are of great help to the farmers as all the economically important traits are included in them in order to correspond with the breeding goal.

Table 3: Weights of different traits in countries exporting to the CR in 2006

Country	Production traits	Type traits	Fitness traits
USA (TPI)	50	30	20
Netherlands (NVI)	40	27	33
Germany	50	15	35
France	50	12,5	37,5
Canada	54	29	17
Italy	59	23	18
CR	60	25	15

Source: Holstein International 10/2006

The differences between the composition of indexes used in exporting countries and the CR are rather small. The farmers use the index as the first criterion for bull selection.

The Association recommends the farmers to use the bulls proven abroad and listed among the best 10 % in the country of evaluation. The same recommendation is also used for national bulls. Semen importers usually respect such recommendation as it is more difficult to sell the bulls with lower breeding values.

Selection of herd bulls

In the past, the main objective of Czech dairy farmers was to increase milk yield and to achieve profitable milk production. In that they succeeded to a great extent as the average milk yield has increased by 280 kg annually over the last 15 years. The farmers have mostly focused on the bulls improving milk performance. The main selection criteria were selection index, breeding values for

kg of protein, udder, and feet and legs. In 10 years, the milk yield has increased by 3000 kg but, at the same time, the production life has been reduced by 0.5 lactation.

Table 4: Trends of several Holstein cow traits in the CR

Trait	2006	2001	1996
Age at first calving (mm/dd)	26/22	27/12	28/07
Milk yield kg	8336	7079	5339
Calving interval (days)	421	407	406
Number of lactations at culling	3.5	3.6	4.0

In the CR, the breeding values for bull's own fertility and fertility of daughters have been calculated for 25 years. However, they have not been used much by the farmers as these have preferred production traits. The number of cows culled due to fertility problems has not practically changed over the time. Nevertheless, the overall conception rate of cows was decreased, which appears to be influenced mainly by the herd management as the genetic tendency remains stable.

The breeding values for udder health have been available since 2005. The farmers have always put stress on the traits of udder and feet and legs due to milking in milking parlours and high concentrations of loose-housed cows. In the last 10 years, the percentage of cows culled due to udder disease has been reduced by 2.8 % in spite of the fact that the farmers have not been able to make selection based on the breeding values for udder health.

Table 5: Causes of culling in Holstein cows (%)

Trait	2006	2001	1996
Udder disease	7.9	8.2	10.7
Fertility disorders	21.4	19.2	20.9
Difficult calving	12.6	11.6	8.0
Other health causes	42.1	42.9	35.0
Other (age, production)	15.9	19.3	25.4

In the last years the farmers have devoted more attention to the breeding values for milk components. The reason has been the changed criteria of milk realization when the price is currently more significantly affected by the content of protein. The production breeding values are still quite important as well as the breeding values for udder traits and feet and legs. Growing attention is being paid to udder health and fitness, especially fertility, longevity, and course of parturition.

Semen market

The competition on the Czech semen market is extraordinary. All the important European or North American AI companies sell semen directly to farmers or through national AI companies. They employ highly trained specialists with good knowledge not only of bulls but also of other aspects of the dairy herd management. To make a selection decision, the farmers have available all the known information on national and foreign bulls from the country of evaluation or the Interbull.

Mating plans for large commercial herds are usually produced by the specialists from AI companies. The selection of bulls used for insemination is a result of discussions between the herd manager and often several dealers from different companies. With respect to the existence of the free market with semen, the farmers benefit from the competitive environment to obtain better prices and various discounts. This is why the price of bovine semen in the CR belongs among the

lowest in Europe. Pedigree analyses and mating plan elaboration are offered free of charge by company representatives as part of marketing; they also often use their own company's software. However, a primary motivation of some national AI companies and foreign bull semen sellers is "to sell" rather than to satisfy the needs of farmers. As a consequence, some farmers have their mating plans proposed by an independent specialist, sometimes also by a farmer.

The most reliable breeding values are those determined in the CR as the daughters of a bull tested in the CR will probably repeat the results from the test. The farmers often prefer using a bull which was previously tested in the herd with good results.

The bulls tested abroad are selected according to the breeding values published by the Interbull or the values from the country of evaluation. The correlations between the Interbull values at the time of import and the breeding values based on the subsequent results of daughters in the CR are quite high.

The existence of a competitive semen market along with the free access to information allows a wide selection of sires and the possibility to compare their quality including the ratio price/breeding value. On the other hand it is necessary to mention that the discussions with several representatives of AI companies or semen dealers visiting farms after each publication of new breeding values, then comparison of results, and evaluation of information are very time-consuming.

According to my opinion, the farmers do not sufficiently utilize all the values provided by the Interbull. A criterion frequently used by farmers for Holstein sire selection is the comparison of the re-calculated index TPI used in the USA. If the bull is listed among TOP 100 TPI sires, there is a good chance that a lot of farmers will use him. Such a selection method makes in a way sense with regards to the likely end of milk quotas. The bulls originating from European programmes would be more frequently used if the selection indexes applied across Europe were unified. Joint estimation of breeding values based on integrated methods of animal evaluation and listing of bulls according to "European complex selection index" might be an ideal solution. Such measure would also support a continuing globalisation and international interconnection of breeding programmes.

Semen price plays an important role

Expenditures associated with semen purchase represent costs. However, there is a specific price range in which this purchase of semen may yield a gain. On the contrary, there is also a price which can make the recovery of costs more than problematic. Essential semen costs are those associated with obtaining a heifer. Herd reproduction is also very important. Good reproduction results mean that it is possible to buy more expensive semen without increasing costs per calf. The farmer has usually a certain limit on what he can pay for a dose in year-average. It mostly ranges from 10 to 18 €. In commercial herds this figure is closer to the lower limit while in breeding herds it is closer to the higher limit. From the cost point of view, a critical figure is the weighted average of semen price. For example, in case of using 30 % of young bulls (3 € per dose), 15 % of excellent foreign herd improvers (35 €), and 60 good herd improvers (12 €), the weighted average price per dose is 13 €. The necessity to reduce costs also applies to purchase of semen. A growing demand for cheap semen from both proven and young bulls selected on the basis of MAS can be assumed for the future.

Popularity of American bulls

American sires are quite popular for Czech dairy farmers. The proportion of semen from the bulls proven in the USA sold annually on the Czech market is approximately 25 %. This fact might be surprising for a common European farmer. The most frequent answers for the question "Why do

you use American bulls?" are: We use a similar system of large dairy herds fed TMR based on maize silage as in the USA. Increasing of milk production is an important economic factor and it is associated with a higher herd turnover rate, similarly as in the USA. Bulls are tested in the USA under similar herd conditions as in the CR. The farmers have had many opportunities to make sure that an American bull with good test results can very probably repeat these results with his second crop daughters. A number of Czech Fleckvieh farmers started with Holsteins after they had visited American farms. For them, USA is a symbol of the Holstein breed. The representatives of American AI companies helped them to develop their herds and they were - and still are - the source of new information about the Holstein breed.

Selekta Pacov

The company Selekta Pacov was established in 1992 after the privatization of the state-owned enterprise. The company pursues similar business activities as the former state enterprise. The main activities are dairy cattle and potatoes breeding. The company is farming on 923 ha of land at the altitude ranging from 480 to 611 m above the sea level. The total land consists of 780 ha of arable land and 143 ha of meadows and pastures. The company has 47 employees. The average rainfall is 650 mm per year and the average temperature 6.8 °C. The plant production is mainly focused on growing feedstuffs for cattle and potatoes. In the past, the company developed 11 new varieties of potatoes. The crop structure is: cereals 220 ha, potatoes 200 ha, rapeseed 90 ha, maize for silage 90 ha, horse bean/cereals mixtures for silages 90 ha, and grass/clover mixture 90 ha.

The animal operation is oriented at the production of milk. The cattle herd consists of 270 cows, 230 young cattle, and 100 fattening bulls. It became a tradition that each cow has its name.

In 1992, the grading up programme was started within the original cattle herd. All Czech Fleckvieh cows were inseminated by the semen of Holstein bulls. It was necessary to change the housing system. The original tie-stall barn did not comply with animal needs and welfare and did not facilitate to increase labour efficiency. In 2003 - 2004 the barn was re-constructed for the loose-housing cubicle system and it was decided to start using milking robots. At first, the herd of crossbred cows was far from being homogenous and therefore the breeding goal was focused on increasing milk production with stable milk components, increasing the size of animals, udders, and feet and legs. Only 50 % of animals could be housed in the new barn as the remaining cows did not comply with the new technology and had to be housed in the tie-stall barn. The number of the personnel was reduced to 7-8.

Previously, the breeding goal was aimed mainly at higher production. At present a lot of stress is put on feet and legs and udders. We also try to improve longevity of cows. With respect to the fact that no breeding values have yet been estimated for longevity in the bulls tested in the CR, we also select on the traits associated with longevity like udder traits, feet and legs, and somatic cell score. On the other hand, we avoid too angular bulls. As our cows are automatically milked by milking robots, we also pay attention to the breeding values for udder depth, teat placement, and teat length.

The average milk production was increased from 6049 kg milk, 4.26 % fat and 3.33 % protein in 1997 to 9214 kg milk, 3.77 % fat and 3.43 % protein at present. The average somatic cell score is 157 thousand. Although it is not the main breeding goal, the milk production is constantly growing.

The company co-operates with two national AI stations and one company importing semen from US bulls. The best sires are mated to heifers, first-calvers are inseminated by young bulls, and older cows by proven bulls. The average semen price should not exceed 16 € per unit.