A system of quality control of milk in the Brest Region of the Republic of Belarus

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The milk productivity of cows of public herds in our Region was already determined in the early 1950s immediately after the creation of collective farms. The quality of milk was determined at the same time.

Initially, the work was being done not in order to determine the productivity of each animal, but in order to determine the total, gross milk yield in the farm subdivisions. This allowed the control of the expenditure of milk for internal farm needs, for sales to the State and to other consumers. In the first years, when determining the pedigree value of the cows, the quality of milk was determined by the content of fat in milk and then also by the protein content.

For a long time this work was done with the help of manual centrifuges and simple fatmeters (buttermeters). Then the same centrifuges with electric motor drives began to be used which made the work easier.

From the mid-1970s, the functions of determining the quality of milk produced by collective and State farms (the fat and protein content) started being fulfilled by the district pedigree stations and the milk laboratories attached to the stations. The specialists on the farm did the controlling of milking and selection of milk samples and they were delivered to the laboratory by the transport that belonged to the pedigree stations where the quality of the milk was determined. The results of the studies were promptly reported to the farms. The same centrifuges were used in the laboratories.

At the end of the 1970s, new devices, which were manufactured in Denmark, were brought to half of the districts of the Region, six milk testers and six pro-milks. The first determined the fat content of the milk with the rate of up to 100 samples an hour and the second determined the content of fat and protein simultaneously with the same productivity. One specialist and three to five laboratory assistants conducted the studies. They determined the quality of milk of two to six thousand cows a month.

In the mid-1980s, other pedigree stations bought more productive devices-CZhM-1, manufactured in the Ukraine. They determined the quality of 120 samples of milk an hour.

In order to determine the quality indices more exactly and in a more centralised way, in 1987 an independent central regional laboratory which was to determine the quality of milk, was created in the village of Maisk, located in the Ivatzevich region. According to an agreed schedule, samples of milk were brought from the collective and State farms of the Region using the transport of the pedigree stations. At first, the laboratory was equipped with the devices brought from the pedigree stations and served four districts of the Region. In a year, the samples of milk were already brought from farms from all regions.

In 1988, new, more productive devices "Milko-scan605" and "Fossomatic-250/360" were bought using hard currency. The first device determined the fat content in milk at the rate of 600 samples an hour or the fat and protein content at the same time at the rate of 450 samples an hour. The second device determined the content of somatic cells in milk from 250 samples an hour.

The results of the analyses using the old devices had to be manually transferred to the statements of control milk yields, reading them from the display. New devices were equipped with a recording mechanism, but the data taken from the tabular forms also had to be transferred manually to the statements of control milk yields. That is why one had to develop and master the programme of automatic processing of the data from all devices and of the transfer of these indices directly to the statements of control milk yields.

At the present time, information about the results of analysis of the quality of milk comes to the district pedigree stations from the laboratory within a few days and from there it goes to the farms. The data on the fat and protein content are interesting, first of all, to the livestock specialists of the farms and the data on the presence of somatic cells, to veterinary specialists. That is because they are practical guides for exposing and treating sick cows.

Requirements for the quality of milk constantly become more stringent. Whereas before, when the milk was sold to the State, the fat content, mechanical contamination and acidity of milk were considered. Afterwards, its density was additionally determined.

Beginning in 1984, milk plants started to receive milk which was cooled on the farms and also with a low micro-organism content. The presence of micro-organisms in milk is determined with the help of a special reductive sample.

In the current year, new technical requirements for "cow's milk and purchase requirements" were introduced by the decree of the Ministry of Agriculture and Food of the Republic. In this document the requirements for a number of parameters are made more stringent. Most importantly, for the first time, requirements for the determination of the presence of somatic cells in milk were introduced.

According to the new technical conditions, there should be no more than 500 000 somatic cells in 1 millilitre of highest quality milk and in milk of first and second grade, not more than 1 million.

When milk is accepted, organic leptic indices, temperature, density, acidity, cleanness, weight share of fat and also the effectiveness of thermal treatment, are determined for each lot.

Bacterial count, the presence of inhibiting substances and somatic cells in milk, is determined simultaneously at least once a decade.

In addition, there is control over the presence of neutralising substances, toxic elements, antibiotics, pesticides, pathogenic micro-organisms in milk and over the level of radioactive contamination of milk, which is coordinated with the appropriate authorities.

It should be emphasised that the production capacity of the device "Fossomatic-250 / 360", that belonged to the regional laboratory, did not allow for the determining of the presence of somatic cells in milk of the cows of all farms of the Region. This became known to our colleagues from West Germany with whom we collaborate, according to the Pilot-Project which was coordinated between the Ministry of Agriculture and Food of the Republic of Belarus and the Ministry of Agriculture and Forestry of Germany.

Our German colleagues, considering our difficult situation, allocated a new high productivity device "Combi-foss," manufactured in Denmark, to our laboratory as a part of humanitarian aid. It determines the weight share of fat, protein and the quantity of somatic cells in milk at the same time with the productivity of 360 samples an hour. Using this device, today more than 100 000 samples of milk are processed during one month with a two-shift workday. The other Dutch device processes about 40 000 with a one-shift workday, which covers more than 60% of the milch herds of the Region as a whole. That is why there is no longer a necessity to use old domestic devices. The production capacity of the laboratory at the present time allows to additionally check the quality of milk produced by the fifteen milk-processing enterprises of our Region and also by the pedigree plants of the Republic.

In the laboratory, all work is being done by a group of eleven people. Considering the economic importance of determining the quality indices of milk and the difficult financial situation on the farms, they are compensated 40% of the costs of performing this work from the regional budget.

It should be noted that there are no such laboratories in other regions of the Republic. These functions are fulfilled by the district pedigree stations.