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Technological aspects of milk farms robotization

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Modern cattle breeding enterprise that is modernized high-technology production with full processes automatization is reviewed. Production of appropriate environmentally sound milk is based on cows physical state, comfort of their presence during all technological cycles, regular reproduction, quality of dairy materials and long term productive animal usage.

Enterprises specialized in dairy cattle breeding using cow Voluntary Milking System everyday control live weight and animal champ process, determining optimal period for insemination, technological requirements for cow udder, etc.

Optimization of all technological process is achieved by using integrated herd control systems and cattle breeding object management by computer and informational technologies.

Technological processes, voluntary milking system, live weight, insemination, cow udder, integrated management a herd

To maintain a sufficient level of milk production profitability, to improve the quality and biological safety farmers are forced to actively use the achievements of science, including cybernetics, and implement technologies aimed at creation favorable conditions for animal's to maximize manifestation of their genetic abilities.

Modern livestock enterprise is a modernized, high-tech production with full automation processes. Most farms are equipped with high-tech equipment, where all processes are computerized. For instance, presently automatic feeders, robot-milkers (Voluntary Milking System – VMS,), sorting gates for suspicious and diseased animals removal, electronic scales for monitoring changes in live weight of cows, rotary milking machines and other efficient technology solutions for livestock are developed. Usage of such equipment requires creation of computer

database for each animal, daily monitoring of physiological state and the rules of technological process.

Therefore, on the dairy enterprises when using cows voluntary milking systems particular attention is paid to the daily control of live weight and to the process of animal chewing, identity of the optimal insemination period, technological requirements to the cows udder and others.

The daily loss of animal live weight – is an early indicator of such disease as metabolism disorder or acute lameness. Control of cow's live weight performs during lactation for the period (100, 101-200, 201-300, etc. days) on the electronic scales. The live weight of cows ranges ± 60 kg. If the loss of their live weight will be 8% or more, it is necessary to review feeding diet, especially its structure. For the record animals daily live weight loss should not exceed 0.8%, or 4-5 kg. It can detect animal with suspicious disease 3 days before compared with normal supervision.

It is also necessary to control cow's chewing process. Chewing process reflects the functional activity of the gastrointestinal digestive system, the ratio of gross, rich and concentrated feed, energy balance in animals feeding diet.

The norm of chewing process for Holstein's is 410-550 minutes during the day. The increase of this index (550 minutes) reflects the high content of fibrous feeds that is specific for standard feed. A large number of animal feed may result effects of acidosis or ketosis. If the chewing process is less than 410 minutes per day - this indicates a decrease in fermentation processes, high acidosis rumen risk, possible clinical symptoms of inflammatory breast cancer bacteria E. Coli.

Exclusive place in the computer system of integrated herd management takes control of its reproduction and reproductive monitoring of each cow cycle. Special sensors (Rescounter or Responder), are placed on the neck or on back limbs of animals registering their motor activity. By female physical activity sexual inclination period and optimal timing for insemination are determined.

Automatic milking provides maximum comfort and minimum stress to the animals. The voluntary milking system is the most accomplished method of milking. It allows getting milk by the most humane way that reflects cow physiology. The device stores features of each cow udder and it takes that into account during the milk selection. Using robot-milker promotes that any problems with mastitis disappear from the farm.

Experience shows that the transition of robots use is very longstanding, at least 1 month. This is assuming qualified veterinary staff and selected flock by exterior features: height in withers - at least 140 cm, body length 160 cm, distance between udder and surface - 80 cm, 60 cm in average. Special meaning is udder health form, teat length – 30-70 mm, teat diameter – 15-50 mm and oblique angle of all teats in all directions – degrees 45°, distance between udder bottom and rear teat tip – min 30 mm, Distance between teat tips and floor – 270-750 mm, distance between teats or teat and cow – min 15 mm.

To manage the majority of manufacturing operations in the dairy complex, platform Delaval Delpro™ Farm Management is used. It implements intelligent functions for integrated management of dairy farming. Wireless two-way communication "human - animal" allows to receive real-time information for quick and accurate reporting, reminding about what to do with each animal and prepare terms of reference for farm specialists.

To conclude, robotized cow's milking promotes timely detection of defective animal's feed diet; milk separation produced by cows that have hidden and clinically characterized mastitis; identify the optimal period for females insemination; cow's udder technological requirements, etc., which increases the accuracy and effectiveness of product accounting and cow's selection using this technology.

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