What else can a robot do? Reducing the use of hormone in the dairy industry!

Contrary to an increase in milk yield, dairy cows exhibit weaker and shorter heat signs than ever before. It causes a stockman hard to observe the estrus signs. Thus, efforts to promote reproduction efficiency have focused on administration of hormonal protocols to synchronize estrus and ovulation, which in turn has increased public concerns over food safety. The use of estrogenic compounds has been banned in the European Union member states, New Zealand, and Australia. Implementing hormones in animals will become even more severely restricted in the future.

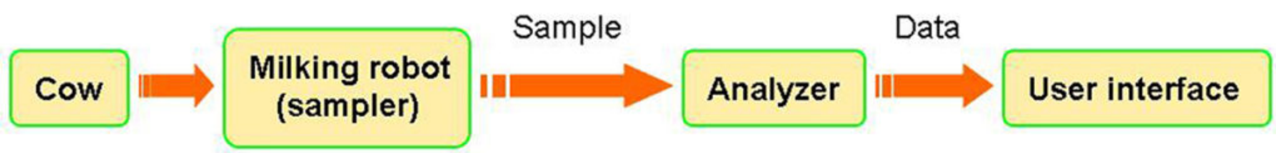

Fig. 1. Flow diagram of the inline progesterone monitoring system. An inline sampler in the milking robot automatically collects the milk sample. The sample is then submitted into the analyzer, where progesterone is quantified. After that, the data are sent to the user interface.

Frequent monitoring of reproductive cycle can provide reliable information for artificial insemination in dairy cows. Progesterone in milk is an ideal biomarker. However, current routine methods performed in the laboratory for progesterone quantification usually need intricate facilities and equipment. High cost, special skills and knowledge limited their application.

A fully automated real-time progesterone analyzer named Herd Navigator (Lattec I/S, Hillerød, Denmark), which can be combined with a DeLaval milking robot (DeLaval Inc., Tumba, Sweden), has recently become available, which helps to overcome these problems. The system modulates the frequency of assays to an average of 6 to 7 progesterone analyses per cycle according to the puerperal period and the stage of the estrous cycle. During milking, an inline sampler in the milking robot automatically takes a representative sample with several milliliters of milk from an individual cow. The sample is then submitted into the Herd Navigator. There, progesterone is quantified based on an immunoassay. After that, the analyzer sends the data to the user interface (Fig. 1). For cows in heat, an alert is displayed with a percentage of success of a prospective insemination. Integrated with other relevant budgetary information, i.e., prices for feed, livestock, milk, veterinary services, and artificial insemination, the user can then set specific criteria to conform to the herd policies for breeding.

The inline progesterone monitoring has resulted in a reasonably accurate system, and it is currently being further tested with larger numbers of animals and under various environmental conditions.

Heat detection using inline progesterone monitoring that does not involve any hormonal breeding protocol is therefore an appropriate method. In addition, early progesterone information used to diagnose pregnancy and reproductive diseases maximizes the efficiency of production, health, and welfare of the dairy herd.

With the growth of population and consumption, the number of cows per farm is increasing dramatically worldwide. Higher reproduction efficiency and reduced disease incidence brought by the inline progesterone monitoring system are supposed to decrease greenhouse gas emissions from milk production and help the dairy industry management to become more sustainable and profitable.

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