

Dairy Dynamics: Modernizing the Farm with Technology

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ABSTRACT

Technology made the life of a farmer easy and comfortable by securing his crucial time. Milk production of commercial dairy farms has been increased in recent years due to proper feeding management and good milking practices. The use of technology has also enabled us to figure out the sick animals in order to give prompt treatment and avoid further economic losses.

Keywords: Technology, Dairy, Feeding, Milking

Introduction:

Technology system organized to achieve high input in less time. These systems are used in many fields and industries. The milk production of commercial dairy farms can be increased on high level by using advanced technologies. The total number of dairy cows increased at substantial rate in last 50 years. This indicates the rise of dairy industry in recent years. This is possible due to the improvement in our management breeding, genetics and improved nutritional management of dairy animals. As a result, small scale farmers are creating large farms by the help of technology [1]. Some of these technologies are enlisted below;

Computerized farming technology:

Computerized farming technology is an advance technology that helps to manage and examine the animals at farm at an ease. Keeping record of farm has become uncomplicated for a farmer. A farm at California is testing an advanced technology system that helps to monitor the cows by their facial expression. Many cameras are present in different places of farms which monitor the group or a single cow behavior. When behavioral changes occur, farmer can easily find out the affected animal. Every camera observes a group of cows (16-17 cows) or a single cow within a group. When a cow suffers from illness or any disease, the system helps the farmer to find out the affected animal and give it timely treatment. There is another benefit of this system to observe the cows for their feeding behavior, which helps to calculate the feeding requirement of production animals. This system also helps to maintain cleaning at farm by identifying dirty places. A computerized feed delivery system [CFDS] allows each dairy cow or group of cows to receive a specific ration depending upon lactation phase [2].

Robotic cow milking:

Many dairy farmers are using the robotic cow milking technology which is a precise method. Good milking systems make the cows happy and free from udder and teat disorders. So, if cows are comfortable and healthy, we can increase its milk production. Another benefit of this technology is that it is less labor intensive which provides an ease to the farmer. It is a hygienic technology through which diseases can be controlled which are spreading through wet hands. A long-term investment is needed to install this milking system. The herdsman spares a lot of time to visualize the dairy animal's activities leading to a flexible working environment at dairy farm. This system allows to detect the metabolic disorders i.e., lameness and mastitis at an early stage through ground reaching data set which allows less visit of lame cows at the milking parlor and timely treatment of infected animals. The stage of estrus can also be detected by observing the changes in the activity levels of animals [2]. However, an adaptation period of few months is needed to the dairy animals to get accustomed with this robotic system which may decrease the milk production during early days of newly installed system. Automatic milking system also decreases the chances of intra-mammary infections by using separate data set for each quarter. According to a review, there exists a negative correlation between robotic and simple machine milking systems. The occurrence of subclinical mastitis (SCM) at larger dairy farms due to poor management may affect the udder health at places where automatic milking systems are installed. Thus, it is recommended that the herd manager must take proper care of teat disinfection to avoid SCM cases while implementing machine milking system [1].

Parlor monitoring:

Parlor monitoring help to measure the daily milk production of a dairy farm. It can also measure the dairy milk protein and fat by some other systems. Measuring the somatic cells also helps to check the milk quality. If any cow is decreasing milk the parlor monitors will send an alert. Farmer will find such cow and will give treatment and necessary changes in its nutrition. It's the

best way for farmers to ensure each animal is performing at optimal levels and to show your team when an animal requires intervention. Charting group and herd performance, and detecting changes or irregularities give you a tool to use to respond to these variations, and make improvements to benefit individual cows, groups, the herd and your team [1].

Rumination collars:

Rumination Collars helps to measure the dairy cow rumination which help to ensure a smooth transition period by using the microphone. If any change occurs in the rumination, it's mean that it is a sign of calving disease or negative impact of previous ration changes or cow comfort. It also monitors the temperature which help us to prevent the cow from heat stress [3].

Rumen bolus:

Main role of rumen bolus is to detect the digestion disorders. It helps to measure the pH level of rumen. Normal pH of rumen is necessary for the dairy cow's health because if the food digestion will not completely occur then milk production automatically fall down. It also measures the rumen temperature as normal temperature helps in the cow comfort. The bolus is administered through oral route just like a magnet which settles down in the reticulum. As the battery life of each bolus is up to 4 years, there are very less chances of any cow to need more than one. The bolus sends an update on cow movement and temperature to the base station after every 10 minutes and the data then uploaded on a cloud system via broadband or 4G. This information is then interpreted by a software and the farmer receives an update alert on their smart phone or computer [4].

Implementation of solar panels:

Implementation of solar panels help us to reduce the consumption of energy and ultimate costs. The cost of electricity bills or generator fuel can be minimized by implementing this technology. It's another benefit is it reduces the highly harmful gases such as Chlorofluorocarbons (CFCs) etc. [5].

Conclusion:

Technology plays an important role in dairy farm management. It helps to control many diseases and provide proper feeding and milking methods and availability of fresh water. It provides mechanized system and get rid from more labor. Dairy industry is going on peak level due to support of technology.

Fig.2: Steps of polymerase chain reaction

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