**Precision Dairy Farming - Helping our Farmers Feed a Growing Nation**
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The dairy industry is an important component of Northern New York's economy. Every link in the food chain – from the farmer to milk hauler to processors, each component is dependent on the other for stability and growth. In NNY the number of dairy farms has decreased, the number of cows has decreased, and the human population that the dairy farmers need to feed continues to expand. At the same time demand for milk is increasing due to the growing population and the yogurt boom,  dairy farming profit margins are at a record low, (income - cost of production), the dairy farmer needs to look at ways to become more efficient as well as take into account the consumer demands for food safety, animal welfare and environmental impact. Across NNY (Clinton, Franklin, St. Lawrence, Jefferson and Lewis counties) milk production/cow has increased, this is one of way of measuring farm efficiency.

Farm efficiency has potentially increased through the adaption of Precision Dairy Farming is defined as information and technology based farm management system to identify, analyze and manage variability within farm management for optimum farm performance, profitability and sustainability. Dairy cows, like all living organisms are complex, individually different and time variant animals – they respond to change. Precision Dairy Farming is understanding how management decisions will impact the animal and the environment while being proactive to only make positive changes. The goals of Precision Dairy Farming are 1) maximize individual animal performance, 2)detect illness early, and 3) minimize the use of medication through preventative health measures.

When it comes to the cattle – farmers work with the physiology of the cow. They want to prevent external management activities that could disrupt the internal metabolic system of the cow lead to a lower efficient cow (less milk production, increased illness). Farmers and their advisors create management measures that facilitate the optimal health of the cow. Prior to making a change to housing, the milking parlor or feed deliver, the farmer and his team of advisors must think about how could this impact the the cow. Then ask will this change help to optimize management practices, environmental conditions, health & reproductive performance and milk production.

Precision dairy farming, like many other businesses relies on up to date technology to monitor daily performance of the dairy farm as well as the physiological status of the cow.

- Milk yield, component and electrical conductivity – These measurements are sensitive to changes in animal health status. Milk yield and conductivity changes can be observed 5 to 10 days before a cow is ill. This alerts the farmers that a cow may not be feeling well, even if she is not showing visible signs of illness. Changes in milk components (fat & protein) alert the farmer to metabolic disturbances within the cow that cannot be visually detected.
- Walking activity – just like people, cows have pedometers. A decrease in daily walking activity can be an indicator of digestive disorders or a sore foot. An increase in walking activity may be an indicator of estrus.
- RFID Tags – Radio frequency Identification tags – These can be utilized for identification of animals (traceability) in the milking parlor, at the feed bunk or in the barn.

Some dairies have taken greater steps into precision dairying and have moved towards the use of robots to milk and feed their cattle. This model allows for the animal to choose when it wants to eat or be milked. In Clinton county we do not have any robotic milking systems but we do have some producers using robotic calf feeders. In this type of system calves are grouped with up to 20 "friends" and can drink milk anytime during the day they wish. The farmer can adjust the amount of milk a calf can consume throughout the day, and the computer will alert the farmer if a calf has not had a meal within a set number of hours.

Increasing personal time and maximizing farm labor are two opportunities of implementing Precision Dairy Farming practices. These technologies can benefit farmers of all sizes and management styles (organic &

conventional). They allow they smaller farmer to specialize in an area where time management demands may be limiting (heat detection).

Dairy farming is a decision-intensive enterprise on a daily basis. Farmers must rely on a whole farm approach to determine the best options to maintain a profitable system that is accountable to consumers for animal well-being, environmental impacts and quality products. Dairy farmers cannot made profitable decisions without understanding the impact on the physiology of animal or the environmental impact of the land. Precision Dairy Farming technologies provide tremendous opportunities for improvements in individual animal management on dairy farms.