

# Currently Available Precision Dairy Farming Technologies

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One trend within the dairy industry today is the increased incorporation of computers into the day-to-day management of dairy herds. Computer use aids producers in the management of their herds and allows for better record keeping. The next step in on-farm technology use is the use of precision dairy farming technologies. Precision dairy farming technologies are instruments to measure physiological, behavioral, and production indicators for individual animals. In the past few decades, precision dairy technologies have become available, which when implemented properly, make dairy producers more efficient. Efficient dairy farmers have a better chance at staying competitive and financially secure as milk prices become increasingly volatile. When financially sustainable technologies and good management practices are used in unison, new levels of farm productivity become obtainable.

Many different kinds of technologies exist in the market today. The sheer number of various technologies and the information produced by them can be overwhelming and confusing. Information about these technologies exists but can often times be hard to find or difficult to understand. Unfamiliarity with technologies and how they work can become an obstacle to overcome, especially when comparing and contrasting technologies. This fact-sheet will list several of these technologies and how they accomplish their goals.

## **What technology best fits my needs?**

The decision to adopt a technology depends on factors such as management style, familiarity with computers, ease of use, type of housing system, and perceived benefit to cost ratio. Technologies monitoring various parameters are available to farmers and often these technologies fall into categories including:

- Nutrition- individual feeders, mixing equipment, and water supplies
- Production- in-parlor controls and monitors
- Animal health- mastitis, rumen health, metabolic disorders, and body temperature
- Fertility- estrus and calving detection
- Environmental- temperature and milk line vacuum

Additional categories exist and as technology continues to advance, new kinds of technologies monitoring new parameters will come into existence.

A non-exhaustive list of popular technologies available today, can be found at:  
[http://afsdairy.ca.uky.edu/files/extension/decision\\_aids/Precision\\_Dairy\\_Technology\\_List.xlsm](http://afsdairy.ca.uky.edu/files/extension/decision_aids/Precision_Dairy_Technology_List.xlsm)

This list includes information pertaining to each technology and outlines its location relative to the cow, what it measures, and reports generated from those measurements. Additionally, links to the various technologies' websites are provided to allow for access to additional information. Below is an explanation of the location and parameters measured by each technology.

## **Location of Technology**

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**Bulk tank**- in bulk tank

**Ear**- mounted to the animal's ear

**In-line**- between milking unit and bulk tank

**Leg**- mounted to animal's leg

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**Milking unit-** on milking cups, inflations, shell, or claw of milking units

**Neck-** mounted to, or going around, the neck of an animal

**Parlor-** utilized in or near the parlor

**Rumen-** inserted orally and residing in the reticulorumen of an animal

**Rump-** mounted to the rump of an animal

**Vagina-** vaginal insert

### Parameter measured

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**Animal position/Location** - locates animals within a facility or pasture

**Blood content in milk** - determines general udder health and SCC through monitoring of blood content in milk

**Body weight** - detects changes in animals' total weight to evaluate the health and efficiency of feed energy conversion to milk

**Cow activity** – collects two-dimensional and three-dimensional animal movement data to monitor health and estrus behavior

**Feeding behavior-** monitors eating events and durations to observe health, behavior, or estrus

**Fertility hormones (e.g. Progesterone)** - determines reproductive performance by quantifying the amounts of circulating reproductive hormones and determining estrus or pregnancy

**Jaw movement/Chewing activity** - tracks eating events and rumination as indicators of animal health, nutritional, and reproductive performance.

**Lameness-** monitors animal mobility

**LDH (Lactate dehydrogenase)** - detects changes in level of LDH to predict udder health

**Lying/Standing behavior-** collects level of activity and three-dimensional movement of animals for monitoring animal health, comfort, and activity

**Mastitis-** detects changes in whole udder or individual quarters for detecting and quantifying level of infection

**Milk components (e.g. fat, protein)** - quantifies and monitors milk constituents

**Milk conductivity-** determines changes in milk ionic concentrations to indicate milk fat, protein, lactose, or somatic cell count quantities

**Milk flow-** milk produced in a given amount of time that is generally used for automatic take-offs, preserving teat ends

**Milk time-** monitors the time a cow or each individual quarter spends milking

**Milk yield-** amount of milk given by individuals or groups of animals

**Rumen pH-** health through monitoring of rumen pH

**Rumination-** determines health and estrus by quantifying eructation

**Somatic cell count-** determines udder health through the somatic cell count of milk originating from all or individual quarters of the cow

**Standing heat-** records events where a cow or heifer stands to be mounted

**Temperature-** determines estrus, calving, stress, or general health of an animal by monitoring temperature in the ear, rumen, vagina, or milk

**Vacuum in milk line-** preserves teat ends by monitoring fluctuations in vacuum strength present at the teat ends

Disclaimer: The University of Kentucky and its staff do not endorse any of the companies or technologies mentioned in this publication. This list is non-exhaustive and will continue to change as new technologies become available. If you know of a technology that you believe should be on this list, please email [matthew.borchers@uky.edu](mailto:matthew.borchers@uky.edu) or [jbewley@uky.edu](mailto:jbewley@uky.edu) with the information for the technology.

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