Methods of Precisely Managing Precision Dairy Farming Technologies On-Farm

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Precision Dairy Farming is the use of technologies to measure physiological, behavioral, and production indicators on individual animals to improve management strategies and farm performance. These systems have the potential to detect disease and estrus and evaluate cow comfort by monitoring activity, feeding time, lying time, mounting activity, real-time location, reticulorumen pH, rumination time, or body temperature. Although potential benefits to implementing a Precision Dairy Farming system exist, obstacles that may prevent proper Precision Dairy Farming device management must also be considered. The data provided by a Precision Dairy Farming device is only valuable if it records the data properly for the right cow and is used by the producer. This factsheet will describe problems that researchers at the University of Kentucky have experienced and ways to avoid and manage them.

Device management

Keeping track of which device belongs to each cow will ensure that the data recorded is linked to the correct animal. One way to track this is to keep a paper copy like the one shown in Table 1. The information from the paper copy can then be entered into the computer software program that logs the device's data. The paper copy should be retained in case there is a mistake in data entry and corrections can be made.

Date	Cow #	Device #	Assigned or Removed	Entered in Software	Initials

Table 1. Example recording sheet.

Remember to double check the cow number and the device number, and make sure all handwriting is legible. For example, if a cow is assigned a device different from the one she is wearing, could result in breeding or giving injections to the wrong cow. Another potential problem that could occur is if an incorrect number for a reticulorumen bolus is recorded, it is impossible to find out the correct device number because the bolus is not accessible. When placing devices on cows, it is better to have a few people helping to reduce the chance of a mistake. In addition to records of devices, excess activity events (hoof trimming, vet checks, regrouping etc.) should be noted. This note allows producers to correctly interpret data and whether or not the data is showing true events for the cow (i.e. is a cow really in heat, or did she show excessive activity from another event).

Device placement

Many devices are designed to attach to a specific area of a cow's body (i.e. the leg). This varies between companies and device purpose. When checking cows to ensure devices remain attached, having a consistent area of attachment across the herd will make it easier to check.

In rare situations, swelling may occur where the device is attached to the cow, either from the device rubbing against the animal or because the cow gained weight and the device was not loosened. This could be painful for the cow and affect production, but removing the device as soon as it is noticed will allow for swelling to cease. In certain cases, the device may be moved to the opposite side of the body (i.e. from the right to the left leg), during the time of healing. If this is not feasible, then removing the device completely until the swelling is gone is the best option.

Reassigning lost and dead devices

When a device dies, is lost, or is not reading in anymore, replacing it with a functioning device will ensure that data continues to be recorded, especially if the producer is solely relying on the device for important decisions. Producers will want to do this as quickly as possible, so that they are continuously receiving data from the cows. Producers will also want to record the information regarding the replacement device on paper in a format similar to the data sheet example shown in Table 1 and enter this information into the software. The next step is to remove the old device and assign the new device in the software as soon as possible. Failing to do so may result in improperly recorded device numbers for cows in the software. For example, if a device is changed on the cow, but is never recorded in the software then the producer will never receive data from that individual cow. Unfortunately, it may not always be immediately obvious that a device is dead or is not recording anymore. Some software programs create a list of devices that are no longer working. If the software does not have this option, monthly each cow in the herd should be looked up individually to ensure that the devices are still working.

Devices sometimes fall off. Ensuring that devices are found quickly will help ensure data is continuously recorded for each cow. One way to do this is to have a "lost and found" box where employees can put the devices. With many cows on one farm, it can be hard to see that a particular cow has lost her device. So checking for devices in the whole herd could be incorporated into the milking routine once a month.

Producers should look for devices not recording complete data in previous records from the system. The best way to do this is to look at the cow's previous record for any empty spaces or blanks in the data. If this is a common trend, contacting a company representative is the next step to correct the situation. Producers would then want to assign another device if this is the case. Evaluating the condition of devices is also important to make sure that the exterior of the devices are not damaged. Damaged devices are less likely to work efficiently.

Reassigning devices can be simple as long as there are standard procedures in place. Managing reassigned devices can most commonly be done through management systems, specifically dairy management software (i.e. PCDART or Dairy Comp 305) or an Excel spreadsheet. Some of the Precision Dairy Farming device manufacturers are able to receive data from the dairy management software. Systems that communicate with the dairy management software allow for device numbers to be easily changed through the dairy management software and automatically updated to each system. However, keeping track of devices changing between animals is important for future reference in case systems fail to communicate properly or if a device number is entered incorrectly in the software. This can be done by keeping a handwritten notebook, by exporting reports from the software, or recording the data in an Excel sheet.

Conclusions

The data Precision Dairy Farming devices provide can be extremely valuable, but only if they are managed properly. Seemingly easy tasks, like making sure device numbers correspond to the correct cow, are often complicated by other farm tasks and are sometimes overlooked or forgotten. Improperly managed devices will be a source of frustration rather than

a source of information. Keeping the potential problem areas in mind when dealing with Precision Dairy Farming devices and making them a priority in a daily management routine will lessen the risk of mistakes.