DAIRY VETERINARY NEWSLETTER

July 2015

Keypad "Dispensing Machines" for Medications and Supplies on Farms and in Veterinary Facilities

Something new for medication and supply storage - accountability and inventory monitoring

There is a lot of information in the dairy and veterinary literature about farm and/or vet practice personnel management, including dealing with cultural differences, authority structures, motivation, hiring, discipline, communication, avoiding "procedural drift" where employees gradually change the way things are done from what is supposed to be the protocol, etc. One thing that I rarely see written about is theft by employees or possibly farm visitors. It does not come up much in talking with dairy producers or veterinarians either, at least in my experience. However, especially as farms get larger with more employees and visitors, some producers do suspect that occasional theft occurs.

The temptation for anyone on a dairy farm or in a veterinary practice who may raise animals – including non-dairy animals – of their own to steal medications or other supplies certainly is present. Some people might rationalize that a large business that buys in bulk "won't miss" a bottle of medication or some other supplies. A new technology available has been associated with less unexplained disappearance of drugs and other supplies from dairy farms where it has been installed according to what I have been told empirically. I have not seen specific numbers, but this is an impression from some producers.

As always, this newsletter is not intended to endorse or criticize any particular products or brand names. Nevertheless, practicality requires some identification of specific products or devices. Apex Supply Chain Technologies is a company that has made "point of use vending systems" to control dispensing of tools, paint and other industrial supplies for some time. Now they are selling a vending machine that stores "medications, cleaners, vaccines, and other consumables" according to a brief communication in Progressive Dairyman, March 12, 2015 by J. Hurty. I have begun to see these on dairy farms. A photograph appears on the next page.

Image from World Ag Expo 2015 and Progressive Dairyman

These storage cabinets have some useful and interesting features:

- Each employee can be given a unique PIN number to use a keypad to enter the storage cabinet. The date and times when they opened and closed it are recorded. I have seen the device set up this way.

- If desired, it can be programmed such that its weight sensitivity monitors and records how many of each item in each storage drawer has been removed, for items weighing between 1 ounce and 22 pounds.

- If desired, it can be programmed to alert someone when an item is either completely gone or at some desired "critical point" such as when only 2 are remaining, etc. Or it can be programmed to automatically reorder the item when the critical supply point is reached.

- Monitoring the cabinet data can be done by smart phone or tablet according the company website. I have seen it done on a desktop PC in the farm office.

- The walls and sizes of the storage compartments are customizable. A small refrigerator can be put into the cabinet in this way.

I have not seen a farm using the inventory control options yet. As mentioned earlier, I'm told that the use of this kind of storage has reduced unexpected or unusually rapid depletion of supplies. Producers also like the clearly visible secure display of supplies in one location, and the ability to monitor product use even if only by looking into the cabinet.

If there is a valid reason why one or more people are removing an unusually high (or low) amount of a certain item per unit of time, management can ask about it. It has been almost universal in my experience that I find that computer management programs on farms do not have all cases of disease or other events recorded if you

have a chance to compare to paper logs, treatment area marker boards, health events recorded as part of a field research project, etc. It remains true that approximately half of dairy farms do not permanently record treatments or cases of disease. Using a storage cabinet like this can alert owners and key management personnel when drugs or other supplies are being used at more or less than the expected or typical rate. If some preventative program is lapsing, or there is an increase in one or more diseases being treated, this can be detected relatively quickly and investigated.

Some supplies are either too large (or their packaging and delivery method, such as on pallets, is too large) to fit in the cabinet, or their use necessitates their being taken to a treatment area such as a hospital barn or near a tilt table, etc. to be used over time there. Similarly of course, supplies in a veterinary practice often need to be taken to treatment or surgery areas to be used there.

A final benefit that was pointed out to me was that milk inspectors (and I would assume FDA inspectors or state supervisory inspectors if they visit the farm or practice) like the demonstrated commitment to control of drug and medication use on the farm.

One important fact that I have not been able to learn on farms or from the company website is the cost of these cabinets. Whether veterinary practices are using this technology and what their impressions are I have not heard; I hope that if any of our readers are using such technology they will let me know about their experiences.

Calving Area Isolation for Cows Including Adjacent to Large Group Closeup Areas

I noticed from the time I first began riding on large animal calls as a pre-vet student that many beef or dairy cows on pasture would seek to calve in very isolated places, including being backed up into thorny bushes, against creeks, etc., guaranteed to make some dystocias on down cows more memorable. Some calving cows that were missed had to be "hunted for" to detect where they might be within some of the only brush, trees, etc. in a large open area. This makes sense for ruminant animals descended from prey species.

Dairy cow calving area isolation

There is increasing evidence that dairy cattle, including those in large herds with little experience of being isolated from other animals, desire an isolated area to calve in when one is available. There is considerable research today into preferences of dairy cattle and calves regarding housing, feeding, handling facilities, etc. Not only does this make sense because of all of society's interest in humane care of dairy animals and farm animal welfare in general, it also makes sense physiologically and in terms of good animal husbandry for production animals.

Research by K. Proudfoot et al., summarized in the May 2015 Dairy Today, and also reported in J Dairy Sci, May 2014 investigated calving dairy cows, and some post-calving sick dairy cows and their reaction to isolated spaces when available. In Denmark, 79 Danish Holstein multiparous cows were assigned to 6 blocks based on expected calving date (12 to 16 cows/block). Two weeks before expected calving, the entire block was moved into either of 2 group pens; some other cows with later due dates were also present to ensure that there were herdmates remaining out in the group pens after the last experimental cow in each group calved. Objectives were "to determine if (1) cows were more likely to calve in a secluded area and (2) cows that became ill after calving would spend more time in the secluded area."

As labor began, every other calving cow was moved into either uncovered or partially covered individual calving pens. All pens were 9.8 ft (3 meters) wide, 14.8 ft (4.5 m) long and with walls 4.3 ft (1.3 m) high. Partially covered pens had plywood walls 5.9 ft (1.8 m) high all around except for a 4.9 ft (1.5 m) window on one end that allowed a view of cows in the adjacent large group pen. The window included the gate that opened between the individual pen and the group pen:

Image from Dairy Today, AgWeb, University of British Columbia

Cows and calves remained in the individual pens for 3 d after calving. Cows were milked 2X and feed (trough on end opposite the gate/window) and water (bowls) were provided in the calving pens.

The authors did an excellent job of excluding some cows from final analysis and explaining the reasons. Cows were excluded if: they calved early in the large group pen (n = 10), had dystocia or twins (n = 7), were disturbed by straw bedding being added during labor (n = 1), had milk fever (n = 2), calved within 8 h of being moved from the group into the individual pen (n = 18) [I would not have excluded these cows; I would like to see the analysis both with and without these cows], or if in an uncovered pen, they calved next to a plywood barrier (this was not clear to me, how some uncovered pens had a plywood barrier) (n = 2). This left 39 cows who calved and remained in the study, 19 in partially covered pens and 20 in uncovered pens.

For the second objective regarding behavior of sick cows, 15 cows in the partially covered pens that were among the 18 that calved within 8 h (mentioned above) were included, resulting in 34 cows that had calved in the partially covered pens that were eligible for study of well vs. sick cow behavior.

Case definitions for, and study of sick cows

Rectal temperatures were measured twice daily at milking time for 3 d post-calving; ≥ 2 consecutive T >39.0° C (102.2° F) was one criterion for a sick cow. A health exam was performed 3 and 9 d after calving. Metritis (vaginal exam, 4-point scoring), ketosis (blood, Precision Xtra meter), and clinical mastitis (gross appearance of milk, milker assessment) along with fever defined a cow as sick. I suspect that ketosis did not require fever, but the paper reads as though fever was necessary to define illness; this is probably because they had no ketotic cows anyway. 3 cows had metritis, 6 had mastitis, and there was one case of pneumonia but no case definition was given. Treatments were described in the full paper, including beta-lactam antibiotics, sulfa-trimethoprim, and flunixin meglumine.

For one analysis of sick cows (only the 19 cows calving in partially covered pens), there were 9 sick cows paired with 9 healthy cows based on time in the calving pen before they calved, so one cow was left out. The pairings by pre-calving time in the pen were done because the 9 sick cows had been kept in the partially covered pens with a large time range before calving (0.8 h to 120 h). No mean or median times were shown.

"One experienced observer collected all data from video. The video was used to determine the time and location of the cow at the moment of calving (i.e., when the calf's hips were fully expelled from the dam). Behavior was measured from 6 h before to 72 h after calving using 10-min scan sampling. -- the location of the cow in the pen, the posture of the cow (standing or lying), and the proximity of the calf and the cow (i.e., within or greater than 1 calf-length apart) were recorded." The paper includes a complex description of how it was determined whether a cow was in the (sheltered) corner, window with a view to the other cows outside in the large group pen, or center of the pen. It was sometimes quite difficult to determine whether a cow was completely in any one of the 3 locations. Dry matter feed intake was measured for 3 d post-calving.

The full paper has a long description of statistical methods. Data analysis was mostly by ANOVA (SAS 9.2 PROC MIXED).

Results for calving and sick cow locations within open or partly sheltered pens

"Cows in the uncovered pen showed no side preference; 10 calved on the corner side and -- 10 calved on the window side of the pen. Cows housed in the partially covered pens preferred to calve in the corner, with 15 of 19 cows [79%] calving [in the corner] ($P = 0.01$). Cows housed in the partially covered pen used the corner more in the 1 h before ($P = 0.003$) and 1 h after ($P = 0.02$) calving compared with those housed in the uncovered pens." Type of pen, whether a cow was sick, or specific disease had no relationship to where the calves were located in relation to their dam.

Sick cows "spent more time in the corner compared with healthy cows during the 3 d after calving ($P < 0.001$)." More results including about feed intake were presented in the full paper.

The paper has a good literature review of earlier studies regarding cow seclusion behavior, including at pasture and in large and small indoor housing areas. The authors concluded, "When given the opportunity, cows housed in individual maternity pens preferentially used a secluded area to calve. Cows began using the secluded area more in the hour before calving and continued to use it more for the hour after calving. Ill cows - - spent more time using the secluded area compared with healthy cows."

5600 Old Main Hill
Logan UT 84322-5600

These studies are interesting, and as mentioned earlier are pertinent for animal husbandry and in light of society's interest in perceptions of animal welfare. To me, the practicality of converting pens with pipe gates or with other largely open sides to partially covered pens by adding plywood is quite reasonable. A potential pitfall on dairy farms might exist, it seems to me. If cows often choose to calve in a secluded place out of ready view of farm personnel, especially when it may be some distance from a walkway, then monitoring of calving cows for dystocia or other problems may be reduced between the times when the cows are milked, fed or re-bedded. Observation from a distance all through the day (or night) may be impractical. More study regarding the optimal degree of seclusion vs. open sides in cow calving areas is likely to continue.

Please let us know your comments and also suggestions for future topics. I can be reached at (435) 760-3731 (Cell), (435) 797-1899 M-Tues, (435) 797-7120 W-F or **David.Wilson@usu.edu**.

David Wilson, DVM

Extension Veterinarian