Introduction
In an attempt to create a learning opportunity during the ambulatory rotation that could be mutually beneficial to student, ambulatory practitioners and faculty coordinators alike, a new student exercise was introduced this past academic year. Each student was given 3 questions, one that related to dairy facilities, one that focused on the lactating cows and a third that pertained to calves. For a practice hosting multiple students, each student brought a different set of 3 questions. In all, 5 sets of questions were prepared. Each question required data collection by the student from as many relevant farms as possible.

In the attached report, we present facility, cow and calf related information gathered from WI and IL dairy farms served by veterinarians in the 25 practices participating in the UW School of Veterinary Medicine’s ambulatory rotation this year. Thank you for your cooperation and assistance. We look forward to your feedback on this project, comments on the report and good ideas for new questions for the Class of 2012!
Calf Questions

Question 1:

What is the volume (capacity) of the esophageal feeders on the dairies you visit? How many esophageal feeders are found? Express as a ratio of esophageal feeders to number of preweaned calves.

Responses:

Data from 130 farms show that the 2-qt capacity esophageal feeder has the dominant presence (Fig 1.1). While the 2-qt capacity feeders are ideal for administering oral electrolyte solutions, their use for administering 4-qt of colostrum dictates that they must be passed, pulled, refilled and passed a second time. For reluctant calves, inexperienced feeders or over-worked calving pen personnel, the second 2-qt of colostrum may not be administered when this is required.

![Volume of Esophageal Feeders](image)

On average, we found 1.2 esophageal feeders per farm (157 esophageal feeders on 130 farms). Considering that these esophageal feeders were distributed amongst 2,466 calves on milk or milk replacer, the ratio of less than 1 esophageal feeder per calf indicates limited capacity for force-feeding colostrum or oral electrolyte solution with any consistency and/or significant concern for overuse of a limited number of potentially contaminated esophageal feeders.

We encourage dairies to have 4-qt capacity esophageal feeders in the calving area, the number matching the number of calves born per day at the highest calving density. The 2-qt capacity esophageal feeders can be reserved for oral electrolyte solution (OES) administration and the
number should reflect the number of calves that require forced administration of OES on any one day (2 feeders per 50 calves on milk/milk replacer for expected level of scours).

Question 2:

For dairies feeding milk replacer to calves, determine the percent crude protein and fat from the milk replacer label.

Response:

On dairies feeding milk replacer to calves, conventional milk replacers predominate. The crude protein (CP) percent ranged from 18 to 28% but 87% of 119 dairies fed either a 20 or 22% CP milk replacer (Fig 2.1). With the recognized importance of higher protein requirements for growth of preweaned calves, mammary development and future production, a change in conventional milk replacer feeding is not yet apparent in these data. As expected, 94% of 129 dairies feed a 20% fat milk replacer (Fig 2.2).
Question 3:

What vaccinations are given to calves before weaning?

Response:

From 84 dairies, the 4 most common vaccines used in calves are Inforce™ 3 (20%), Calf-Guard® (18%), Bovi-Shield® (14%), Bovine Ecolizer® + C (11%) and an E. Coli vaccine (J-5 or J-VAC®). A wide range of vaccines is used in preweaned calves, many of which are not labeled for this age.
Calf Questions

Question 4:

If oral electrolytes (OES) are used to rehydrate scouring calves, what product is used? From the OES label, determine the ingredient that is added to correct metabolic acidosis (usually this will be bicarbonate, acetate, citrate or gluconate).

Response:

Data from 60 farms showed that commercial oral electrolyte solutions are widespread in their use. From 85 different OES products found, 11 products emerge as the most popular (Fig 4.1), with Land O Lakes® Electrolyte (23%), Blue Ribbon Calf Electrolyte Pack™ (22%), Bluelite® C (15%) and Hydra-Lyte® (15%) enjoying the most use. Bluelite® C is formulated to correct metabolic alkalosis common to adult cattle and is, therefore, not the best choice for a scouring calf with metabolic acidosis.

The alcalinizng ingredients represented in 85 OES products are the following:

1. Sodium bicarbonate 59%
2. Sodium or potassium citrate 22%
3. Sodium acetate 13%
4. Calcium lactate 1%
5. Gluconate 1%
Question 5:

Place the primary milk product fed to calves in one of these categories: pasteurized whole milk (saleable and non-saleable), non-pasteurized whole (saleable and non-saleable) milk or milk replacer?

Response:

From 64 dairies included in these data, 50% feed milk replacer, 25% feed pasteurized whole milk and 25% feed non-pasteurized whole milk (Fig 5.1). Compared to the most recent NAHMS USDA dairy study in 2007, these data are comparable for the percent of dairies feeding milk replacer. Unlike the Dairy Study in 2007, which showed about 4% of all dairies (30% of dairies with 500 or more cows) feeding pasteurized saleable and/or non-saleable milk, 25% of all the dairies in this data set fed pasteurized milk.

![Type of milk for calves](Fig 5.1)
Question 1:

If oxytocin is used for milk let down on the dairy, how much is given (1 ml=20 units)?

Response:

The oxytocin label suggests a dose of ½-1 cc (10-20 units) for milk let down, a recommendation followed by only 13% of the dairies using oxytocin for this purpose. Oxytocin for milk let down was used by 76% of 170 herds questioned. Data from the 129 herds that use oxytocin show wide variability in the dose used, including extremely high doses that induce uterine contraction (Fig 1.1).

![Oxytocin use for milk let-down](image)
Question 2:

If banamine is used in mastitis therapy, how many cc’s are administered and by what injection route?

Response:

These data from 114 dairies using banamine for mastitis therapy show an average banamine dose of 15.3 cc (~1.1 mg/kg body weight dose for an adult Holstein cow). The range of doses shown in this data set (Fig 2.1) is expected based on the label dose of 1.1-2.2 mg/kg. Despite the label for IV use only, 54.4% of 114 farms use banamine intramuscularly (Fig 2.2)
Question 3:

After calving, what is the first milking that goes into the saleable bulk tank? Based upon milking frequency, how many hours after calving is the milk saleable?

Response:

As reported by 136 dairies, on average, milk is saleable 51 hours after calving. Median hours to first saleable milk are 48 hours. For dairies milking 3X, milk is not saleable at the first milking after calving and only one 2X milking dairy considered milk saleable at the first milking after calving (Fig 3.1).

![Hours of milk with-hold after calving](image-url)

**Figure 3.1**  First Saleable Milk (in hours)

Question 4:

What is the first-line antibiotic used to treat metritis?

Response:

For 119 dairies, beta-lactam antibiotics are the primary choice for metritis therapy. Ceftiofur (Excenel, Naxcel or Excede) is used as first line treatment on 53% if the dairies. Excenel and Polyflex share the top antibiotic choice, each being used as primary therapy on 34% of the dairies.
Question 5:

What is the primary test used by your dairy to detect ketosis?

Response:

Two urine ketone tests – Ketostix reagent strips (65.3%) and KetoCheck powder (28.6%) – are used by most dairies. The gold standard, blood BHBA test, is used infrequently, even less often than the least accurate test, detection of a ketone odor on the breath. The latter test has both poor sensitivity and specificity.
Facilities

Question 1:

How many cows are in the hospital or non-saleable milk pen? Calculate what proportion of the total herd is in the non-saleable milk pen; determine the reason for each cow’s presence in the pen, and express each reason as a proportion of all reasons.

Response (Figure 1.1):

On average, 2.4% of each herd’s cows are in the non-saleable milk pen. By far, fresh cows have the dominant presence (44.8%) in the non-saleable milk pen. Mastitis (20.5%) and lameness (11.2%) are the next most common reasons for being in the non-saleable milk pen. These data represent 77 farms and 663 cows.

Figure 1.1

While the practice of mixing fresh cows with sick and treated cows, primarily mastitis cows, is evident in these data and is common amongst Midwest dairies, it is not recommended. In California and other Western states, the practice is much less common.
Question 2:

In a tie-stall dairy, how many inches forward from the vertical plane above the rear curb is the electric cow trainer? What are the reasons for the cow trainer being switched off?

Responses:

For Holstein cows, the target is to have the trainer 48 inches from the vertical plane above the rear curb. These data from 101 herds show that the median and average distance is 48 inches but the range is very large from 34 to 64 inches (Fig. 2.1). The short distance results in very awkward positioning of cows, while the long distance results in more feces on the platform.

![Bar chart showing trainer distance from rear curb](image)

**Figure 2.1**

**Table 2.1 Reasons for trainers being turned off.**

<table>
<thead>
<tr>
<th>Reason</th>
</tr>
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<tbody>
<tr>
<td>Milking</td>
</tr>
<tr>
<td>Preg Check/Vet work</td>
</tr>
<tr>
<td>Breeding</td>
</tr>
<tr>
<td>Time of day, some on only during day/night</td>
</tr>
<tr>
<td>Cows out of barn</td>
</tr>
<tr>
<td>Stall has standing water</td>
</tr>
<tr>
<td>Cow in stall is too sensitive, wrong height</td>
</tr>
</tbody>
</table>
Question 3:

What is the length of the neck chain in the tie stall barns? Compare this with the length between the lower edge of the head rail and the upper edge of the feed curb.

Responses:

Data collected from 77 and 69 farms, respectively were sorted into 4 categories by 10-inch increments in length (Fig. 3.1 and 3.2). The average and median chain lengths are in the middle category of 21 to 30 inches. The target chain length is related to the distance between the head rail and the feed curb. Modern tie stalls have higher head rails and longer chains, which allow the chain to hang more vertically, facilitating movement without potential leg entrapment. The appropriate length allows the cow turn her head to the side, but is not so long that there is potential to entangle the front leg.
Facilities

Question 4:

How high is the bottom of the waterer above the feed bunk floor in tie stall herds? Is there any obstruction vertically above the waterer to a height of 24 inches?

Responses:

From 50 farms, the average and median heights of the drinking cup above the floor were 19.6 and 18 inches, respectively (Fig. 4.1). No obstructions within a vertical distance of 24 inches from the waterer permit the cow to comfortably place her head into the drinking cup.

![Head rail to feed curb length in tie stalls](image)

![Drinking cup height above floor in tie stalls](image)
Facilities

Question 5:

In the milking parlor herds, how long is the space available for the cow to stand during milking and what is the minimum width of each space (between pipes)? For each herd, note the parlor manufacturer.

Responses:

Milking stall spaces need to be longer and wider for older cows. From 17 farms, the most common length of milking parlor space was 6-feet (Fig 5.1). Most parlors from 24 farms provided 2-2.5 feet width for milking (Fig 5.2) and the 3 most common milking parlor manufacturers from a sample of 38 different farms were Boumatic (42%), DeLaval (26%) and Surge (21%).

![Length of space for milking](image)
Facilities

**Width of space for milking in parlor**

![Bar chart showing the width of space for milking in parlor](Figure 5.2)

**Parlor Manufacturers**

![Pie chart showing parlor manufacturers](Figure 5.3)