

National FFA Convention Team Activity – Dairy - Health/Diseases October 2019

Scenario: This year, you are doing an internship with a local veterinary clinic that has numerous dairy clients. Recently, Fran and Fernando Alexander from FFA Family Dairy requested that both you and the veterinarian visit their dairy to make recommendations to improve the health protocols and address some health issues they have been having with their dairy herd.

FFA Family Dairy is milking 150 cows and raising all needed replacements on the farm. They have a rolling herd average of 28,200 lbs with an average milk fat of 3.9% and milk protein of 3.15%. Their daughter, Faith, recently returned to college to complete her final year in Dairy Science, and she is planning on returning to the farm after graduation. Since Faith left for college, 2 high school students have been hired to help out with the evening milking shifts. The cows are currently milked twice a day in a double-6 herringbone parlor. The farm has freshened a large number of cows over the past 6 weeks. Their goal for cows freshening is for cows to be healthy to help them reach a higher peak in milk production.

Cows are housed in a free stall barn with sand bedding. New sand bedding is added to the stalls 3 times per week. The stalls are groomed at each milking to remove wet sand and fecal material from the stalls.



Figure 1. Herringbone parlor used for milking cows at FFA Family Dairy

One of the challenges for which the Alexanders would like your assistance is a question on the somatic cell count (SCC) of the herd. The SCC of the herd has increased from 130,000 cells/mL to 220,000 cells/mL and the cows have had an increased incidence of mastitis over the past 2 months. They have already had a technician from the milking equipment company come out to evaluate the equipment and vacuum levels and they confirmed that there were no issues with the equipment. In addition, they just had the facilities checked to confirm that there is not any stray voltage.

At milking time, one person remains in the parlor at all times and a second person will assist with the milking when they are not moving cows to and from the parlor. The current milking protocol being used on the farm is:

1. Wash hands with warm water and soap before starting milking
2. Pre-dip 3 cows on one side with a good quality pre-dip
3. Wipe the pre-dip from the 3 cows using a paper towel – one towel per cow
4. Attach the milking unit to each of the 3 cows
5. Repeat steps 2-4 for the remaining 3 cows in the set of 6 cows on a side
6. Wait for the milking units to be removed by the automatic take-offs
7. Post-dip the cows with a good quality iodine-based post-dip before they exit the parlor



Figure 2. Picture showing the condition of the teat ends of many of the cows at FFA Family Dairy

- ✓ What recommendations would you make to FFA Family Dairy to help reduce the incidence of mastitis and lower SCC on the farm?

Another major area of concern for the herd is that they are having transition cow issues and cows are not peaking as high in milk production as they did previously. Due to the size of the farm, all of the dry cows are fed the same ration from dry off until calving. A day or two prior to calving, cows are brought into a small pen where they stay until calving (Figure 4). To determine the calcium status of the cows, blood samples are periodically collected and analyzed for a group of cows prior to parturition and for the first 3 days after calving. Plasma blood calcium concentrations are shown in Figure 3. They have only had to treat one cow for clinical milk fever in the past 3 months. They have had numerous cows that have had a retained placenta. Within the first month after calving, they are seeing cows that are having a cloudy/bloody discharge from their vulva. Some of the cows showing a discharge have also had a mild fever that needed to be treated.

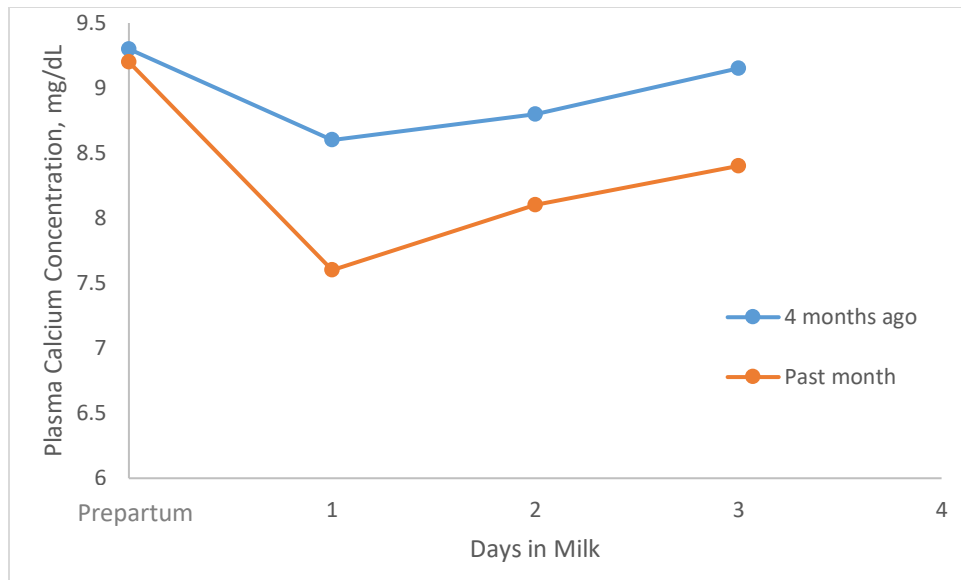


Figure 3. Average plasma calcium concentrations from a group of 12 cows that calved 4 months ago and from a group of 12 cows that calved during the past month.



Figure 4. Calving pen at FFA Family Dairy.

- ✓ Provide suggestions to Fran and Fernando to help them to make changes to reduce the challenges they are seeing with their fresh cows.

Finally, Fernando would like one of the new part-time employees to assist him with giving vaccinations to the dry cows. He is asking you to go over your recommended dry cow vaccination protocol with both him and the new employee to make sure they are using the correct protocols and procedures. In the past, they have been giving cows one shot of the J-5 vaccine (label shown in Figure 6) at the time of dry off and they would like to continue using this vaccine. They also recently purchased a new cattle chute with a head-catch to improve safety for the person/persons giving the vaccinations or doing other health treatments.

- ✓ Outline the complete protocol you would like for Fernando and the new employee to follow when vaccinating the dry cows.

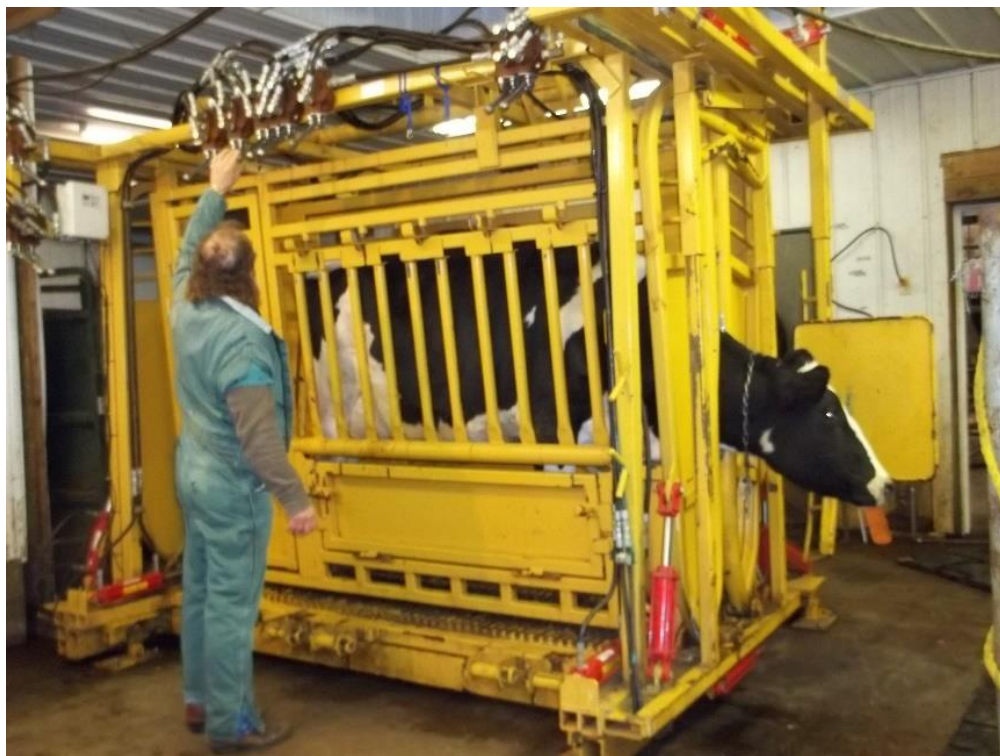


Figure 5. The chute and head catch used for vaccinating and treating cattle. (Photo credit: www.animalclinicofmonett.com)

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HELP PROTECT YOUR HERD WITH THE TOTAL PACKAGE. DEMONSTRATED SAFETY AND EFFICACY.



Dry off isn't complete without vaccinating against *Escherichia coli* (*E. coli*) mastitis. As the No. 1 *E. coli* mastitis vaccine,¹ ENVIRACOR J-5 provides a safe and effective way to help control clinical signs associated with *E. coli* mastitis. Vaccinating against *E. coli* mastitis helps lessen the severity of cases of *E. coli* mastitis and helps provide an opportunity for successful treatment.

The best way to knock out mastitis during the dry period is to implement a comprehensive milk quality program that focuses on treatment and prevention. Visit www.milkqualityfocus.com/drycow to hear from dairy producers and veterinarians who have seen the benefits from investing in comprehensive dry cow management. It pays dividends through improved milk quality and is the right thing for their herd and their operation.

¹BeaconMR™ Q4 2011 MAT.

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▼ Key Benefits

- The three-dose regimen helps stimulate the immune system for optimum response to help control clinical signs associated with *E. coli* mastitis
- Shortens duration of *E. coli* mastitis by 41 percent (64 hours) when compared with control cows,² allowing you to return to salable milk production more quickly
- Increases antibody titers in milk by 13 times²
- Particularly valuable in recently freshened, low-SCC and high-production cows, which may be more susceptible to *E. coli* mastitis.

²Data on file, Study Report No. 3931-60-08-562, Zoetis Inc.

▼ Dosage/Administration

Directions: Shake well. Three doses are required. Administer each 5-mL dose subcutaneously, one hand-width cranial to the shoulder. Vaccinate cows or heifers at 7 and 8 months of gestation followed by the third dose within two weeks postpartum.

Precautions: Store at 35°-45°F (2°-7°C). Do not freeze. Use entire contents when first opened. Do not vaccinate within 60 days before slaughter. Local swelling occasionally occurs and may persist at the injection site. In case of anaphylactoid reactions, epinephrine should be administered immediately.

Mfd by: Poultry Health Laboratories (A Division of PHL Associates, Inc.), Davis, CA 95616

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Figure 6. Label from the J-5 vaccine currently used for vaccinating dry cows.

Answers for 2019 Dairy - Health/Disease Scenario

Overall, this family dairy has a good milk production with a good level of components. They have traditionally been producing fairly low SCC milk, though this has increased in recent months. They are doing a nice job of bedding the stalls and keeping fresh sand in the stalls. Since the return of their daughter to college, effectively trained labor has likely become more of a challenge.

Increased SCC and Mastitis

The increased SCC count could be resulting from several causes, including the milking protocol, teat end condition, training of employees, and the cleanliness of the calving pen.

- The first area that needs to be addressed is the milking protocol.
 - First of all, the milking protocol indicates that the milking units are likely being attached too quickly as only 3 cows are being prepped before attaching the units. Also, there may not be enough stimulation as the cows are not being pre-stripped prior to the pre-dip being applied. The milking protocol should be changed so that all 6 cows per side should be prepped in order before attaching units. Times should be monitored for each step to make sure the protocol achieves correct timing between each step.
 - Cows should be pre-stripped with 2 to 3 squirts of milk removed from each teat prior to being pre-dipped.
 - The milking protocol does not state that the employees milking should be wearing latex/nitrile gloves. Even washed hands are able to transfer bacteria between cows in the milking parlor; therefore, the workers should use gloves while milking cows in the parlor
 - Revised recommended protocol:
 1. Wash hands with warm water and soap before starting milking
 2. Put on latex/nitrile gloves
 3. Pre-strip each cow by removing 2 to 3 squirts of milk from each teat
 4. Thoroughly cover each teat with a good quality pre-dip. Pre-dip (contains a germicide) should remain in contact with each teat for 30 seconds.
 5. Continue steps 3 and 4 for all six of the cows on one side of the parlor
 6. Thoroughly wipe off the pre-dip from each of the six cows, paying attention to ensure teat ends are clean. One towel should be used per cow.
 7. Attach the milking unit to each of the six cows. Units should be attached within 1.5 to 2 minutes from the pre-stripping component of the milking procedure.
 8. Wait for the milking units to be removed by the automatic take-offs
 9. As soon as possible after the milking unit is removed from the cow, post-dip each cow with a good quality iodine-based post-dip before they exit the parlor
 - All cows should be moved calmly to and away from the parlor. While cows are in the parlor, they should be handled gently with no yelling or loud noises.
- Figure 2 shows that the teat ends have hyperkeratosis, a result of teats being milked when milk is not flowing. This is likely a result of a lack stimulation and too short of time from

prepping cows to attaching the milking units. Following a revised milking protocol (as given above) should help to alleviate the hyperkeratosis issues.

- Proper training of the employees is important to make sure that proper protocols are being followed. As new employees have recently been hired, a training and retraining protocol needs to be established so that all workers on the farm understand the correct standard operating procedures and protocols.
- The unsanitary conditions in the calving pen may be contributing to exposure of environmental bacteria and increasing the SCC of fresh cows. Figure 4 shows a picture of the calving pen. The bedding of the pen shows that it is wet and dirty. The bedding should be removed and the amount of bedding needs to be increased to help reduce the exposure of cows to environmental mastitis pathogens.
- Properly administering 3 doses of a J-5 vaccine to help reduce *E. coli* mastitis is another way the dairy can help reduce SCC and mastitis.

Fresh Cows Issues

The discharge and fevers indicate that many of the cows are coming down with metritis (uterine infections). The metritis is likely being caused from a combination of the uncleanness of the calving pen, retained placenta, and from subclinical hypocalcemia that the cows are experiencing. A retained placenta may be the result of a difficult calving, twin births, low dietary selenium and/or vitamin E levels, and/or subclinical hypocalcemia.

- Figure 3 shows a moderate drop in the average plasma calcium concentration of both freshening groups of cows on the first day after parturition, which is normal for cows at freshening. The difference is that the plasma concentration of calcium for cows calving during the past month is dropping lower and is not recovering by day 3 to 4 of lactation. This drop in plasma calcium concentrations indicate that the cows are experiencing subclinical hypocalcemia and are susceptible to various metabolic disorders. As the majority of the cows are not experiencing an extreme drop in plasma calcium concentrations that would indicate clinical hypocalcemia, they are not exhibiting true milk fever. The subclinical hypocalcemia is likely responsible for cows not cleaning on a timely manner and some retained placentas. This will also contribute to the metritis/uterine infections the cows are experiencing.
 - The dairy should visit with their nutritionist to determine if the cows are on a negative DCAD diet to help prevent subclinical and clinical hypocalcemia from occurring.
 - Another possible recommendation would be to administer calcium boluses to cows around the time of calving, though recent research has shown that boluses may not be beneficial for some cows experiencing extended subclinical hypocalcemia.
- The calving pen in Figure 4 shows that there is a limited amount of bedding and the bedding is wet and dirty in much of the pen. The unclean conditions can contribute to more bacteria entering the reproductive system during the time of calving and resulting in uterine and mammary infections. The bedding should be cleaned regularly and additional bedding added to the pen.

Dry Cow Vaccinations

Recommendations for vaccinating dry cows:

- Move the dry cow into the cattle chute before administering any vaccinations (Figure 5)
- Read and follow the directions for any vaccinations that will be administered
- When giving vaccinations – no more than 2 gram negative vaccines should be given at one time.
- No modified live vaccinations should be given to dry cows unless specified by a veterinarian
- Only 1 needle of the proper size should be used per cow
- All vaccinations should be given in the neck area (not in the hind-quarters of the cows) and administered subcutaneously, if labeled as such.
- Vaccines should be stored (and reconstituted, if needed) according to the manufacturer's directions
- Records are kept regarding which cows were vaccinated, vaccination date, product used, and withdrawal time noted in the records.

To correctly administer the J-5 vaccine according to the directions:

The J-5 vaccine should be given to the cows at the time of dry off (7 months into gestation), followed by a booster 1 month later (8 months into gestation), and a 3rd booster after calving. This vaccine should be administered subcutaneously in the neck one hand width in front of the shoulder. This vaccine should be stored in the refrigerator (not on the door) between uses. Records need to be kept that indicate which cows were vaccinated, with which vaccine, date of vaccination, and withdrawal times noted within the records.

Other vaccines may also be recommended to be given at dry off in addition to the J-5 vaccine. No more than 2 gram negative vaccines should be given at a time. Additional vaccines may include a viral respiratory vaccine for IBR-BVD-PI-BRSV (killed vaccine) with 5-way Leptospirosis control, Rotavirus/Coronavirus/E. coli scours, and/or a 7-way Clostridial vaccine including Clostridial perfringens, type C&D.