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Calf Note 213 – Walking the farm, Part 3 – A calving area caveat

Introduction

In the "Walking the Farm" series, I hope to provide some observations and suggestions regarding housing, nutrition and management of calves and heifers. Calf Note #212 discussed briefly the calving area and my thoughts about calf health during this important part of the animal's life.

My personal bias is to manage the calving area so that cows are individually housed and can give birth separate from others in the group. I also suggested that calves be separated as soon as feasible, placed in a clean, warm and dry area and fed colostrum within the first hour of life.

I wrote in Calf Note #145 as a commentary on the "social contract" between agriculture and the consuming public (i.e., everyone). There are some interesting definitions of this idea of a social contract (mostly related to government and political order as in this Wikipedia article), but I choose to define the social contract as the expectations (written and unwritten) between agriculture and the consuming public. Increasingly, consumers want not only wholesome, safe, and nutritious food, but they want it produced sustainably with emphasis on animal welfare and the rights of animals.

Changes to this contract can be mandated by governments or through the supply chain responding to consumer wishes (restaurants, supermarkets, etc.). For example, in the 1990's, European governments mandated – through legislation – fundamental changes to the way veal calves were raised throughout Europe. Initially, the industry rejected the required changes, basically saying that the changes were too great and calf health and efficiency would be compromised. Their arguments did not change the laws, and eventually, the industry found ways to adjust management and nutrition so that all new welfare rules were effectively implemented. Today, the veal industry in Europe is vibrant and the changes actually have resulted in similar or greater efficiency of growth compared to the older practices. But, with greater consumer confidence and acceptance of the industry.

This brings me to the calving area. In Calf Note #212, I recommend that calves be removed from the dam as soon as is feasible, so we reduce the risk of calves swallowing contaminated bedding, nursing from a cow (perhaps not the mother) and ingesting manure instead of colostrum, etc. I recounted a study from Logan et al. regarding the importance of early ingestion of colostrum to calf survival and health.

There is great interest in the media regarding the practice of early calf separation. Some of these articles have a clear anti-dairy agenda; others attempt to justify the practice. Most relate to observations regarding behavior of the cow and calf after separation and the interpretation that these behaviors express pain and anxiety on the part of both cow and calf. Further, organic requirements in many countries state that, to be considered an organic dairy, calves must be left with cows after birth.

I am neither an animal psychologist nor behaviorist, so I'm reluctant to comment on the veracity or utility of observational studies, or those that evaluate the ability of calves to perform tasks or react

to ambiguous stimuli. However, it's not the point of this Calf Note. Rather, I would propose a set of management practices that could allow the calf to remain with the dam for the first 3 days of life with less risk of acquiring a life-threatening disease.

Here are five suggestions that may be valuable if you choose to leave the calf with the cow after calving. Please note, I don't have specific research results to justify each of these suggestions. Rather, they're based on the underlying concepts regarding risk mitigation and the needs of the calf for thermoregulation.

1. **One cow, one pen.** The idea here is to minimize the risk of transmission of potential pathogens to the calf. More cows that have an opportunity to interact with the calf means greater risk of infection.

2. **Clean calving area, clean cow.** Like item #1, the simple idea is that the greater the microbial (bacteria, virus, protozoa) contamination in the calving area, the greater risk of a calf finding that contamination and developing disease. Clean and disinfect the floor and walls. Use clean bedding that is replaced frequently. Provide good air exchange to minimize the risk of airborne transmission. Remember, prior to colostrum consumption, the calf is extremely susceptible to infection.

   Shortly after calving, the calf will stand and begin investigating the environment with a goal of finding the cow and nursing colostrum. The length of time the calf spends investigating and the microbial load in the environment contribute to the risk that the calf will ingest some pathogen and develop a life-threatening disease. Thus, removing as much potential contamination as possible (soiled bedding, manure, other cows) can reduce the risk of infection. Also, studies have shown (e.g., Ventrop and Michanek, 1992) that calves often don't find the udder right away, and spend time attempting to nurse from the cow's flanks, underbelly, etc. If those areas are muddy or soiled with manure, we again risk infection.

3. **Monitor calving ease and special care for pulled calves.** Research has shown repeatedly that calves experiencing a difficult calving will stand later, have lower "vitality" or "vigor" and will consume less colostrum by nursing compared to calves that have no problems at birth. Calves that require assistance should be monitored more closely. Several studies have shown that calves experiencing dystocia are slower to stand and consume less colostrum by nursing compared to calves with greater post-calving vigor.

   Use of non-steroidal anti-inflammatories may be useful to improve calf vigor – talk with your veterinarian about using NSAIDS when necessary. Some research suggests that NSAIDS such as meloxicam may be helpful in invigorating calves and helping them to stand and nurse. Indeed, Gladden et al. (2019) suggested that administration of NSAID ketoprofen improved the welfare of newborn calves regardless of assistance status when administered to newborn Holstein heifer calves. Conversely, Pearson et al. (2019) reported that administration of 0.5 mg/kg meloxicam had little effect on acquisition of passive immunity via nursing in beef calves that required at least minimal assistance.

4. **Feed the calf as soon as possible.** While there may be some debate among veterinarians, ethicists, and producers regarding the value of nursing to the health and well-being of newborn calves, it's my opinion that, unlike beef calves, newborn dairy calves (especially newborn Holstein calves) are less likely to stand, find the teat and nurse successfully within the critical

first few hours after birth. Instead of waiting for the calf to successfully nurse and then feed those that don't nurse by 4 hr with a nipple bottle, I suggest that all calves are fed by esophageal feeder by 2 hr of age. Then, the calf can remain with the cow with much lower risk of ingesting contaminated material and has ingested plenty of colostrum at the optimal time for maximal IgG absorption.

I offer a few research studies as justification for this idea. Wesselink and coworkers (1999) reported that 45% of dairy calves sampled between 1 and 25 hr of age had low serum IgG levels and 33% of these calves had not nursed at all. The majority of calves that nursed in this study did so within the first six hours after birth. Vasseur et al. (2009) reported that only one-third of calves left with the dam >4 hr were observed nursing the dam. Further, they reported that 22% of calves tested consumed <2 L when offered up to 4 L of colostrum by nipple bottle. Besser et al. (1991) reported that 61% of Holstein calves left to nurse the dam have failure of passive transfer, compared to 19 and 11% for calves fed by nipple bottles and esophageal feeder, respectively. Thus, a significant proportion of calves are at risk of failure of passive transfer when left to nurse the dam. Ventrop and Michanek (1992) reported that the time from birth to successful nursing varied from 50 min after birth to >12 hr (end of the study period) and udder conformation played a significant role in the calf's ability to successfully nurse.

A recent survey of organic dairies in Norway and Sweden reported that failure of passive transfer of immunity was 31% on herds that allowed the calves to nurse the dam (calves were left with the dam for 3 d after calving). Calves born on these farms were left to nurse the dam and then assisted if they did not nurse, according to the normal management practice of the farm. Interestingly, assisting the calves or providing additional colostrum by nipple bottle did not improve serum IgG concentration in the test group. Generally, calves that were supplemented in this study were "low vigor" calves that likely experienced dystocia during birth and possibly had compromised ability to absorb IgG. Nonetheless, the high rate of FPT in this study suggests that leaving dairy calves to nurse the dam seems to increase the risk of FPT and predispose a greater number of calves to disease.

When newborn calves were separated from their dams at 2 h of age and fed 180 g of IgG from a commercial colostrum replacer, there was no effect of vitality measures (time to sternal recumbency, venous blood pH, suckling reflex) on IgG absorption (Murray et al., 2015), and, importantly, all calves (n = 48) achieved successful passive transfer at 24 h after colostrum feeding. This study indicates that administration of an adequate amount of IgG (>150 g) early in life can minimize the risk of FPT and disease.

I think it's important to distinguish between studies with dairy calves and those using beef calves to evaluate the importance of early calf separation. Generally, dairy calves are larger. The rate of dystocia in dairy cows is higher than that of beef cattle, particularly in first-calf heifers. The term "mothering ability" is used in the beef industry to describe "*This term is used to describe the natural instinct that the cow has towards protecting and rearing a healthy and lively calf until it is of weaning age. Mothering ability is influenced by a number of factors, such as genetics and environment, and it is widely accepted that a cow's mothering ability is directly related with the growth rate of her calf, and its weight at weaning."* (link). Thus, the heritable trait in beef cattle is that the dam in an active participant to ensure the calf consumes sufficient colostrum from an early age. In beef calves, it appears that suckle reflex and calving ease were highly related to a calf's ability to stand and consume

colostrum within 4 hr of birth (Homerosky et al., 2017). These authors developed a modified APGAR score to indicate which beef calves are at greatest risk for failure to consume any or sufficient colostrum.

5. **Warm the calf if possible.** Calves left with the dam experience similar exposure to the environment compared to calves separated shortly after birth and may need supplemental source of warmth in cold weather. It is more challenging to provide supplemental heat when the calf is left with the cow compared to providing a heat lamp in a hutch when calves are separated. In cases of very cold weather (zero degrees Celsius or below), it may make sense to place the calf in a warming box that is in the pen with the cow and periodically ensure the calf can access the warming box.

   Some studies (e.g., Vasseur et al., 2009) reported little value of providing a heat lamp to calves in terms of colostrum consumption. However, the researchers only provided the lamp for 1 hr after birth and there was no measurable response to calf rectal temperature.

Summary

There is increasing public interest in neonatal management and the practice of separating calves at birth. Organic dairies in many jurisdictions require that calves remain with the cow. Thus, producers may decide to leave the calf with the cow rather than separate them shortly after birth. This change in management requires increased management of the calving area to minimize the risk of disease transmission and ensure early consumption of an adequate amount of colostrum.

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