



Successful Calf Rearing

There are four critical issues that impact successful calf rearing. In fact, research has demonstrated, two of them at least have life-time productivity benefits. They are: colostrum, bedding, grain intake and transition (weaning). Both colostrum and transition have been identified as having whole of life milk production implications. None of these four will compensate the stress of a poor Lead Feed program that results in dystocia (long calving), or poor quality colostrum.

The goal for colostrum is adequate passive immune transfer. The three factors that contribute to this are: 1) quality colostrums – high immunoglobulin content, highly related to protein of the lead feed ration, 2) quantity of colostrum – 2 feeds of 2 litres, 3) timing: within eight hours of birth. The Q-Q-T Rule.

Quality colostrum has twice as much dry matter, three times as minerals, and five times the protein of whole milk. It is also far higher in energy and vitamins required by a low reserve in a new born calf. Over 200 bioactive compounds have been identified in colostrum, some for immune function, others for intestinal development and nutrient absorption capacity and natural growth promoting hormones. Respiratory disease at the milk feeding stage can be related to poor quality/quantity colostrum.

Bedding plays a significant role in maintaining a healthy environment during the milk feeding stage. Sand stands out as the superior bedding for bacterial inertness, drainage and can be raked to maintain cleanliness. Wood chips have a high bacterial load due to moisture content, and straw/hay encourages calves to chew on it. Perhaps the most critical issue on bedding is to separate the feeding area from the bedding. When calves drink or eat they also urinate and excrete manure. A concrete area for feeding enables washing down and keeps bedding clean, dry and relatively bacteria free.

Grain and water intake need to be dealt with together, as they are very dependent on each other. Forage, hay/straw or pasture, must be withheld from calves until at least two weeks after weaning. Calves need to double their birth weight by eight weeks of age. Even after weaning, forage should be limited to 10% of total dry matter intake. This equates to 250 gms of hay and 2+ kgs of grain up to 4 months of age. Young calves' rumens do not have enzymes to digest fibre, nor do they have a large enough established microbial population to ferment fibre.

Grain, or starch particularly, is what develops the rumen. A new born calf has a rumen the size of a cricket ball, and totally inactive. We need to develop this rumen to the size of a basket ball with capacity to absorb nutrients by six weeks if weaning is to be successful.

Only starch will facilitate this. Hay/straw does not produce the right Volatile Fatty Acids to cause rumen papillae (nutrient absorption sites) to grow. The palatability of the starch form is paramount to rapid increase in intake. Trial data lists grains according to palatability to calves as follows: wheat, sorghum, corn, barley and oats. Wheat also has the highest energy, protein density and lowest NDF (fibre - NDF = rumen space or gut-fill).

Grain intake is directly related to water intake, but water intake is about four times their grain intake. That is; for 1 kg of grain intake the calf must drink 4 litres of water, and this is over and above milk intake! Obviously, water access and cleanliness to encourage drinking is central to grain intake and time to weaning.

Finally, transition: And I prefer the term transition to weaning, because after colostrum, nothing destroys profitable cows like poor transition from monogastics (milk fed) to ruminants (solid feeds). Both young calves and babies do not like changes in schedule or environment.

Once calves are eating 500 gms of calf grain reduce milk to 50% (2 lts). Grain intake should double to 1 kg within a week. Over the next two weeks grain intake should increase to 2+ kgs. At this point milk can be stopped altogether. Keep calves in their pens and groups for another two weeks to ensure all are thriving and to prevent forage intake, and avoid 'social stress'. At a grain intake of 2.5 kgs they can be released into pasture, but with hay limited to 250 gms/day.

Respiratory disease at this stage is nutritionally related. The calf that is consuming the above grain/forage ratio will not suffer nutritional stress. Remember, water is the key to the 4:1 ratio of water to feed intake. Most calves die of starvation, not the obvious disease of pneumonia or scours. These are often secondary issues derived from nutritional stress. Respiratory disease is called "the living dead" as these calves often are affected for life and become poor performers in our herds

Mike Van Amburgh from Cornell University presented a paper at the American Dairy Science Association meeting in July 08 which can be summarised in the following quote; "For every additional 500 grams of pre-weaning average daily gain, heifers produced 541 litres more milk during their first lactation and continued to produce more during their second and third lactations".