



PERFORMANCE PRO-BIOTICS
DIRECT-FED MICROBIALS

'FIRE UP' THE START OF LACTATION

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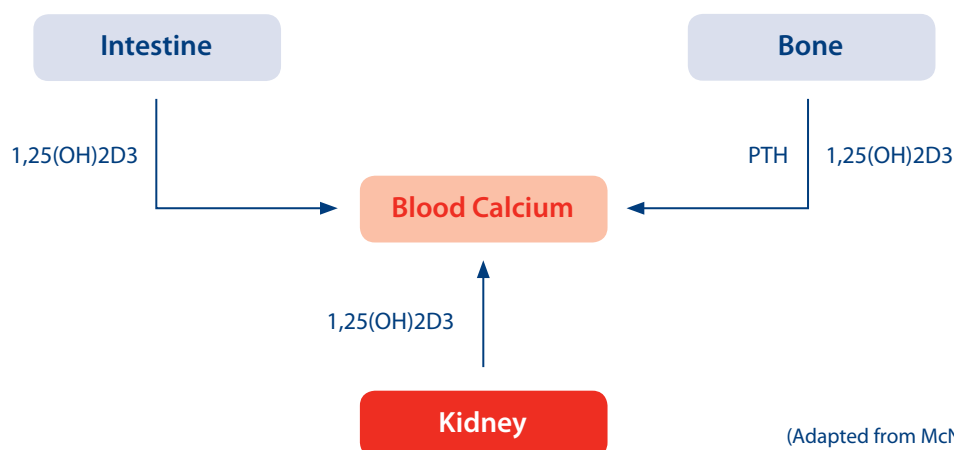
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Calving is an enormous challenge, at a time when the cow's annual performance is being set. Problems at this time will impact her productivity for the year, her health and her ability to go back in calf. The onset of colostrum and milk production increases requirements for energy and protein as well as calcium, phosphorus, magnesium and vitamins and trace minerals. As a result, metabolic systems are stretched and the immune system is compromised. Additionally, appetite is depressed at the same time as there are extreme dietary changes. An appropriate springer diet will "fire up" the cows system in preparation for calving and enable her to meet the challenges of the new lactation head on.

MANAGING BLOOD CALCIUM LEVELS

While only 5-7 % of cows show signs of clinical milk fever, it is estimated that 66 % of cows actually suffer from subclinical milk fever. This is primarily because at calving a cow will lose 9 times the amount of calcium in her entire blood calcium pool. In addition to milk fever, many other metabolic and health problems can be related directly to low blood calcium levels, including retained afterbirth, mastitis, metritis, displaced abomasum and poor fertility.

Calcium will enter the blood from the diet (absorption from the intestine) from the bone and from the kidney (resorption from urine). The presence of certain hormones facilitates these processes of moving calcium into the bloodstream, namely Parathyroid (PTH) and 1,25-dihydroxy vitamin D3 (1,25(OH)2D3).



(Adapted from McNiel & Haussler et al. 1997)

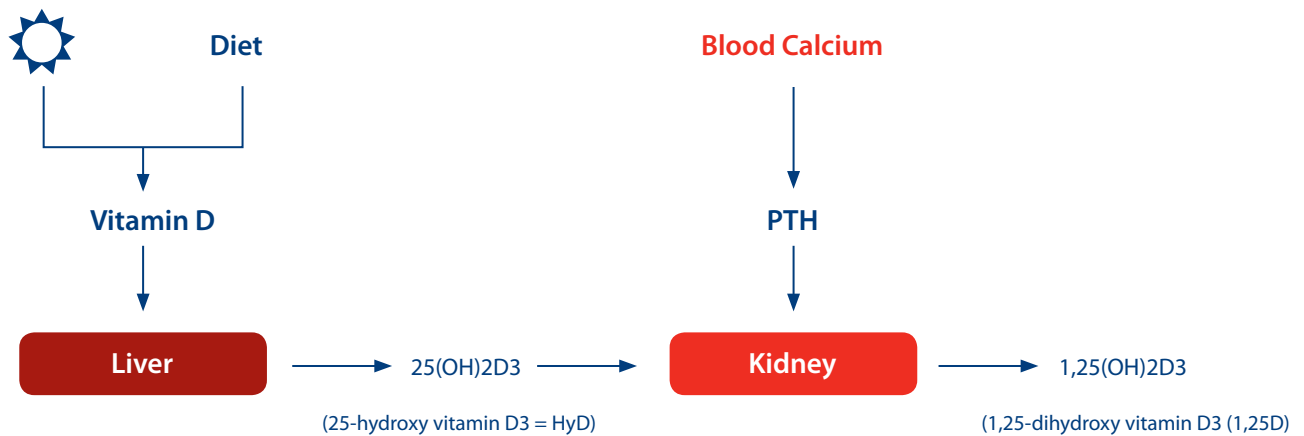
As well as being essential for the movement of calcium into the bloodstream, PTH is produced whenever calcium levels drop, and in turn plays a role in the synthesis of 1,25(OH)2D3. PTH is also produced, and its actions enhanced, when blood pH drops (that is, when it becomes more acidic). This provides farmers and nutritionists with a method of manipulating hormone levels prior to calving to ensure that there are higher levels of calcium in the bloodstream. Acidifying the diet (adding anions, or negatively charged ions) will enhance the action of PTH on bone release of calcium as well as enhancing the production of 1,25(OH)2D3.



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The inclusion of Performance Fire Up will ensure that anionic salts are present in levels capable of making the springer diet acidic enough to prevent many of the metabolic problems seen at calving. In addition to its anionic qualities, Performance Fire Up also contains Hy-D, a middle product in the conversion of Vitamin D to 1,25(OH)2D3. This differentiates it from many of the anionic salt products on the market.

As mentioned earlier, calcium balance is important for more than just preventing milk fever. The contraction of smooth muscles is highly dependent upon optimum calcium levels, as is cell mediated immune response. Strong performance of smooth muscles ensures that the abdominal muscles hold the abomasum in place, preventing it from twisting or moving to be trapped under the rumen. Additionally, mastitis incidence is reduced by strong and timely teat end closure. Cortisol, a stress hormone, is released at calving and acts to suppress the immune system, increasing the risk of retained afterbirth, mastitis and metritis. Optimum calcium balance helps prevent the suppression of the immune system at this time.

URINE PH

The anionic qualities of a diet can be calculated mathematically, referred to as DCAD (Dietary Cation Anion Difference). This is simply the difference between the positive ions (cations) and negative ions (anions), but its use as a tool of measuring diet efficacy is limited by the ways it can be calculated, and by the fact that estimates are often the only figures available for feeds.

Urine pH is a simple tool, which can be used very effectively. A more acidic (anionic) diet will create a mild metabolic acidosis within the cow's system, which will be reflected by more acidic urine (a drop in pH). Measuring the pH of urine of cow's who have been on the anionic diet for a week or more will therefore tell how well a springer diet is working. The target pH for Holstein cows is 6.5 and for Jerseys is 6.0. In order to further drop the pH, slightly increase the level of Performance Fire Up, or drop it slightly to increase pH. Alternatively, contact Performance or your nutritionist to change other diet ingredients.

DACD of Ration	Urine pH of pre-fresh cow	Acid-base status of pre-fresh cow	Calcium status of fresh cow
Positive	8.0 to 7.0	Alkalosis	Low blood calcium
Negative	6.5 to 5.5	Mild metabolic acidosis	Normal blood calcium
	Below 5.5	Kidney overload crisis	

(from Davidson et al. 1995)



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RUMEN HEALTH AND NUTRITIONAL REQUIREMENTS

On most farms the diet of dry cows is relatively poor, at a time when appetite and intake are dropping and the nutrient requirements of both the cow and calf are rapidly increasing. The springer diet therefore needs to provide energy and protein in a nutrient dense bundle.

Cereal grains provide high levels of energy, as well as help prepare the rumen microbial populations for the diet after calving. Additionally cereal grains are high in starch, which when fermented promotes the growth of rumen wall papillae. Papillae are projections along the rumen wall which increase surface area, thereby increasing the ability to absorb nutrients and Volatile Fatty Acids (VFAs). This results in more efficient feed utilisation, but also prevents the build up of VFAs and thus reduces the incidence of acidosis, ketosis and laminitis.

Protein is essential to promote appetite, before calving when intake is dropping, but also after calving thereby impacting milk production at peak, total milk production, fertility and reducing metabolic issues especially ketosis. There are also reports that dietary protein pre-calving has a positive impact on milk protein.

Fibre provides scratch to rehabilitate the rumen wall, promoting better absorption of VFAs. The higher the quality the forage, the better adaptation of rumen bugs and the less energy and protein required from alternative supplements. However, straw should be offered ad lib in addition to better quality forages. This is to ensure that the rumen is kept fully distended, reducing the amount of free space in the abdominal cavity and preventing displaced abomasum.

Direct Fed Microbials are the key inclusion of all Performance products, and play an important role at all times, including the pre-calving period. The probiotic component of Performance Fire Up consists of 5 bacteria (*Lactobacillus acidophilus*, *Bifidobacterium thermophilum*, *Bifidobacterium longum*, *Streptococcus faecium*, *Bacillus subtilis*), 3 enzymes (alpha-Amylase, Hemicellulase, beta-Glucanase) and yeast (*Saccharomyces cerevisiae*). The most important actions of these microbes significantly improve rumen function by facilitating both starch and fibre fermentation, increasing desirable microbial populations throughout the gastrointestinal tract and minimising the reproduction of pathogenic bacteria. The inclusion of DFM is particularly useful at times when the cow's system is under stress, such as the transition period from dry cow to high performance milking cow.

THE SPRINGER DIET

Performance Fire Up, including anionic salts, Hy-D and Direct Fed Microbials, should be fed in the following diet to properly prepare cows for their new lactation.

- 150 – 250 g/head Performance Fire Up (+/- according to urine pH)
- 2 – 3 kg cereal grain
- 0.5 – 1 kg canola meal (or similar)
- 3 kg good quality hay
- Ad lib cereal straw



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This diet provides a sound starting point for any dairy herd, and should be fed for two to three weeks prior to calving. The cereal grain, protein meal and hay will ensure that nutrient requirements are met, while appetite and intake are low, and the straw will ensure that cows are kept full at all times. The inclusion of Performance Fire Up provides cows with Direct Fed Microbials, Hy-D and anionic salts, as well as all minerals and vitamins required for health and performance. Performance Fire Up provides an excellent solution for optimising blood calcium status and preventing a number of potential problems at the crucial time of calving.

FOR FURTHER FINE TUNING OF YOUR SPRINGER DIET PLEASE CONTACT YOUR PERFORMANCE REPRESENTATIVE.

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