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NOVEMBER 2012 NEWSLETTER

WATER

A recent discussion with a client at a herd health meeting got me thinking about a subject that we likely do not pay enough attention to……water and water quality in cows health and production.

Many research and discussion papers on the subject of water quality begin by stating that water is the most IMPORTANT NUTRIENT for our cows, more important even than carbohydrates, fats and protein. When water is included as part of the ration, it makes up greater than 80% by weight. The much reported facts supporting this claim remind us that of all land mammals on the planet, the domestic cow has the highest requirement for water per pound of body weight. The Holstein cows' requirement for drinking water depends on a lot of factors such as, her milk production, ambient temperature and humidity, the dry matter of feeds fed and her dry matter intake, but can range from 115 litres to 150 litres per day.

Interesting other bits of information on cow water intake behaviour are:
- cows will drink for 30 min or less per day.
- 60% of her intake occurs within one hour post milking. This can be a concern with water pressure at bowls in tie stalls or watering available space in free-stalls.
- tie stall water bowls should be able to provide 4 litres per minute.
- at a trough, cows can drink 16 litres of water per minute.

When a water sample is taken, the quality is often assessed in the following 5 categories:
1) Odour/taste
2) Chemical/Physical composition (TDS (salinity) pH, hardness etc.
3) Toxic compounds (if suspected) lead, mercury, arsenic etc.
4) Mineral concentration.
5) Micro-organisms – mainly bacteria, protozoa, virus.

There are numerous sources of information including Ag-Canada websites, OMAFRA worksheets and University extension services that discuss upper limits in each category and effects of poor water quality.

The purpose of this newsletter is to remind us of the importance of including water analysis when investigating health issues on the dairy farm. TDS, the sum of total dissolved inorganic matter include important anions like Sulfates and Chlorides and metals such as iron.

A leading researcher in water quality from Michigan State University suggests that high sulfate levels (>1200 ppm) in water negatively effects fresh cow performance by reducing DMI and milk yield and increasing retained placenta and abomasal displacements.

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Iron is thought to be another problematic element when found in high concentration in water. Iron (Fe) is critical in metabolism and cellular respiration as well as in the ability for blood to carry oxygen. Because feedstuffs usually contain a lot of iron, deficiencies in dairy cows is rarely a problem. The problems occur when high iron levels in water are not accounted for when preparing rations. Iron in feed is in the ferric form (Fe^{+3}) and is only about 10% available. Iron in water is largely in the ferrous form (Fe^{+2}) and is highly available, approaching 100%, according to Dave Beach, Michigan State University. If not accounted for in ration formulation, it is easy to achieve toxic levels or iron.

The results of excess free iron (Fe^{+2}) in tissues is “oxidative stress”. Compromised immune system, retained placentas, mastitis and metritis are a few possible consequences of excess iron.

Soluble iron can also reduce the absorption of other important trace minerals like copper and zinc. Both copper and zinc are known to be important in many body functions including keratin production in hooves and teats. Zinc is also involved in cell division, hormone production and immune function.

It is suggested that water samples be taken 4 times a year (seasonally), but at a minimum annually, or when changes in water quality are suspected.

CQM

Please call the clinic once you have been assigned a date for your CQM validation. We do not have access to this information otherwise. You need to start preparing at LEAST 3 months before your validation.

The next CQM in-class training will be held in December.

Please let us know if you are interested in attending.