



Pre-calving blood sampling

February 2023

Having a well balanced diet containing the right amount of energy, protein and mineral is a key part of having a productive and healthy herd, especially around calving. The correct diet will reduce the risk of metabolic disease around calving and improve fertility for the next year. Failure to get a cow back in calf can often be due to nutrition issues and this will result in significant economic loss. Blood sampling dams pre-birth to assess their nutritional status is commonly done with dairy cattle and sheep but less so with beef herds. From blood sampling pre-calving, actions can be taken to correct any issues found. Having your forage analysed is essential when doing this so informed decisions can be made on how to change the ration.



A minimum of six cows should be sampled from each group and sampling should be done 3-4 weeks before calving is due to start. To get representative results, the cows should have already been on their calving diet for at least two weeks, this is so that levels of the blood parameters measured have had time to adjust to the new diet. You should also make sure that the cows have not been restricted access to feed in the 48hrs before sampling for any reason.

The following is what we test for when doing our in-house metabolic profile, results can be obtained within 24hrs of sampling allowing any changes needed to be actioned quickly.

Magnesium

Studies have shown that beef cattle are often low in Magnesium, a Scottish government study showed over a third of cows tested had low Magnesium levels. Monitoring magnesium is not only important for preventing staggers (hypomagnesaemia), magnesium also plays an important part in how cows maintain their calcium levels. It supports the hormones which control how calcium is absorbed from the gut and mobilised from bone stores. So if magnesium is low the risk of hypocalcaemia becomes much higher.

Hypocalcaemia results in reduced smooth muscle function which will affect uterine contractions during calving and reduced gut motility. Reduced uterine contractions will mean slower calvings, this can result in calves that are slower to stand and slower to take colostrum on board. It will also increase the number of retained cleansings. The reduced gut motility will reduce dry matter intake, this will mean lower milk yields and reduced fertility.

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It is recommended that cows receive 20-30g per day of magnesium from the ration. If forages are high in potassium (2-3%), this will reduce magnesium gut absorption, so a level 30-40g is recommended. When lactating, it is recommended the upper limit of 30g per cow per day is met (40g if high potassium).

Magnesium salts added to feed or water is a cheap and effective way of supplementation. They are unpalatable too, so it is important to calculate the correct amount needed. If too much is added this will reduce feed and water intakes. The magnesium content of the additive is often shown as a percentage by weight. As an example, if a magnesium mineral supplement has 15% magnesium, 100g of this supplement would contain 15g of magnesium.

Protein status

Cows that are fed low quality silage and straw pre calving often have sub optimal protein intakes. Having sufficient protein intakes is crucial in the pre and post calving period as it an important role in calf growth, milk production and fertility. Extremely low protein diets (dry matter crude protein below 9%) rumen impaction can occur due to the build up of indigestible feed in there.

To assess protein intakes we measure:

- Urea – Correlates to the rumen degradable protein in the det and protein utilization
- Albumin – Reflects longer term protein status, will also be low if liver function is low (possible fluke) or Johne's disease is present.

Using forages with a higher protein content or adding feeds which are high in protein (rapeseed meal, distillers grains) are suitable corrective measure if bloods suggest protein intakes are low.

Energy

It is recommended that cows calve with a body condition score of 2.5 to 3. This ensures the cow has energy reserves (fat) but is not too fat at calving which can lead to issues. If a cow is fed a diet where the energy does not meet her requirements, fat will be utilised for energy. Ketone bodies are produced during this process and the level of these in the blood correlates to the amount of fat being mobilised. Therefore cows with inadequate energy in their diet will have high ketone levels. We measure Beta-hydroxybuterate (BHB) which gives us an insight to whether the current energy in the diet is meeting demand.

The table opposite shows having the correct body condition at calving is vital for fertility performance. Cows that calve with a low body condition will have sub-optimal fertility, even if energy intake is increased post calving to compensate. The aim post-calving is that spring calving cows do not lose any body condition and that autumn calving cows and heifers (spring or autumn) do not lose more that 0.5 of a body condition score. If cows lose too much condition post-calving this will delay the resumption of the oestrus cycle and therefore reduce conception rates.

Table 1 Effect of body condition score on conception rate and calving period

100 cows with BCS	% Conceptions to a single service	Expected calving period for over 95% herd
1	35	24 weeks
2	55	12 weeks
3	70	9 weeks
4	60	12 weeks
5	50	15 weeks

Repeat sampling post calving

If issues were found pre-calving and corrective actions taken, re-sampling the cows 2-3 weeks post calving would be really helpful to see whether the actions taken have done the trick. Making sure magnesium, protein and energy are correct at this point will ensure you are giving yourself the best chance of good conception rates when the bulls get back to work!

A lot of the info for this newsletter was taken from a SRUC fact sheet at the following web address,:

<https://www.sruc.ac.uk/media/hwkf4ryd/tn-745-metabolic-profiling-in-the-suckler-herd-457364.pdf>

Wishing you well, Will

