Webinar summary: Tips for measurement and prevention of ketosis

This webinar explores the underlying causes of ketosis in dairy cows and how farmers can use nutrition, blood testing, and practical on-farm strategies to reduce the risk and severity of subclinical ketosis, particularly during the transition period and early lactation. A strong focus is placed on liver function, energy metabolism, protein mobilisation, and the importance of managing over-conditioned cows.

In this webinar:

What is ketosis and how does it develop

Ketosis occurs when the cow's liver becomes overloaded by fatty acids mobilised from fat stores and cannot convert them efficiently into glucose. Incomplete oxidation of these fatty acids results in the production of ketone bodies – BHB and ACAC.

The condition is most common in early lactation when energy demand exceeds intake. Poor liver function, fat mobilisation, and inadequate glucogenesis trigger ketone build-up.

Why liver performance matters

The liver is responsible for converting propionic acid (from the diet) and amino acids (from muscle) into glucose. If the liver is overworked or under-supplied, particularly with key amino acids like methionine and lysine, ketosis risk increases.

Well-functioning livers produce higher glucose, support immune function, and help cows maintain condition and milk production post-calving.

Warning signs and symptoms

- Early indicators of ketosis include:
- Reduced appetite
- Rapid condition loss
- Wobbly gait
- Excessive salivation, licking or chewing
- Sweet-smelling breath (acetone)
- Sleepy or nervous cows

These may be mistaken for milk fever or general metabolic disease.

Interpreting blood results

NEFA and BHB levels are the main diagnostic tools:

- Pre-calving NEFA: <0.3 ideal; >0.5 problematic
- Post-calving NEFA: <0.7 acceptable; >1.0 problematic
- Pre-calving BHB: <0.4 ideal; >0.7 concern
- Post-calving BHB: <0.8 ideal; >1.2 problematic

High BHB + low NEFA suggests poor liver function. In this case, further markers like albumin, cholesterol, and glucose can help assess liver health.

Using cow wearables to identify risk

Research shows ketotic cows lie down less and are more active 3 weeks before calving. Wearables measuring lying time and steps can help detect cows at risk of ketosis before clinical signs appear.

Practical prevention strategies

Common risk factors include:

- Poor transition feeding
- Over-conditioned cows
- Low energy density in feed
- Low protein stores or low protein diets
- Rumen instability
- Hypocalcaemia
- Bad silage or excess butyric acid
- Sudden diet changes

Nutritional strategies that work

- Feed the transition diet for at least 21–28 days pre-calving to build liver capacity
- Balance energy and protein in the transition and early lactation diets. Feed quality starch and quality protein
- Support calcium status through DCAD balancing and bioavailable calcium sources (e.g. gypsum, rumen buffers)
- Match transition and colostrum diets, avoid post-calving feed changes that reduce intake
- Avoid over-conditioning but don't underfeed fat cows; manage visceral fat carefully
- Supplement with key amino acids (methionine, lysine) and liver-supportive nutrients (selenium, betaine, chromium)

Feed additives that support ketosis prevention

- Betaine: Helps process fatty acids and reduce liver stress
- Selenomethionine: Boosts antioxidant capacity (GPX), improves immune function and liver repair
- Chromium: Enhances insulin sensitivity, reducing further fat mobilisation
- Rumen buffers and live yeast: Improve pH stability and feed conversion
- B-group vitamins: Support energy metabolism and liver health
- Boron: Assists with calcium, phosphorus and magnesium uptake

For more details, watch the webinar or download the slide deck.