Webinar summary: Protein nutrition in early lactation

This webinar explores how different forms of protein influence cow performance, rumen stability, liver health, and milk production in early lactation. It explains how protein fractions and energy balance work together to support appetite, reduce metabolic stress, and improve nitrogen efficiency. The session also covers how to interpret milk urea readings, select suitable protein supplements, and match feeding strategies to seasonal conditions.

In this webinar:

1. Understanding protein types

- True protein and non-protein nitrogen (NPN) combine to form crude protein, but only a portion becomes metabolisable protein—the fraction actually used by the cow.
- Metabolisable protein (MP) is made up of microbial protein from the rumen and rumen undegradable (bypass) protein that passes directly to the liver.
- Balancing non-protein nitrogen, rumen degradable protein (RDP), and bypass protein (RUP) is vital for efficient digestion and cow performance.

2. Protein fractions and rumen balance

- Protein fractions (A1–C) vary in how quickly they break down in the rumen.
    - A1: ammonia or NPN
    - A2: soluble true protein
    - B1–B2: moderate to slow degradation
    - C: unavailable to the cow
- Getting the balance right prevents ammonia spikes, improves microbial growth, and supports stable rumen pH and feed utilisation.

3. The rumen–liver link

- Microbial protein and bypass protein are broken down into amino acids in the liver, driving:
    - Protein synthesis – supports liver repair and fat export.
    - Gluconeogenesis – creates glucose for energy and appetite control.
    - Urea genesis – removes excess ammonia from the system.
- Healthy liver function improves nitrogen recycling, reduces milk urea waste, and supports appetite and production.

4. Using milk urea as a guide

- Low milk urea can indicate a shortage of rumen degradable protein or low microbial activity.
- High milk urea may point to excess ammonia or liver stress rather than overfeeding protein.
- Always interpret results alongside fat, protein, and lactose percentages, cow behaviour, and rumination data.

5. Protein requirements through the season

- Dry period: ~12% crude protein to support muscle and amino acid storage.
- Transition period: 14–18% to help the liver use amino acids instead of fat, reducing ketosis risk.
- Fresh cows: ~16% to maintain appetite and production.
- Over-conditioned cows benefit from more protein in the dry period to build lean tissue rather than fat.

6. Choosing effective protein sources

- Soymeal: high-quality and effective for appetite and milk yield but limited by emissions concerns.
- Canola meal: workable alternative, though less palatable and requires higher inclusion.
- Peas: moderate protein; useful in dry summer conditions with added urea.
- DDGs: high in bypass protein; suitable for high-producing cows but won't improve rumen performance alone.
- Palm kernel: moderate protein, limited availability to the cow.
- Emerging options: single-cell proteins and rumen-protected methionine for targeted amino acid supply.

7. Practical monitoring and new tools

- Feed tests showing nitrogen, soluble sugar, and protein fractions help fine-tune diets.
- New platforms like myCOW integrate milk data, wearables, and feed metrics for better decision-making.
- Research from DairyNZ and Fonterra continues to refine nitrogen efficiency and milk urea interpretation for pasture-fed systems.

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