



WHY FEED RUMEN-PROTECTED AMINO ACIDS?

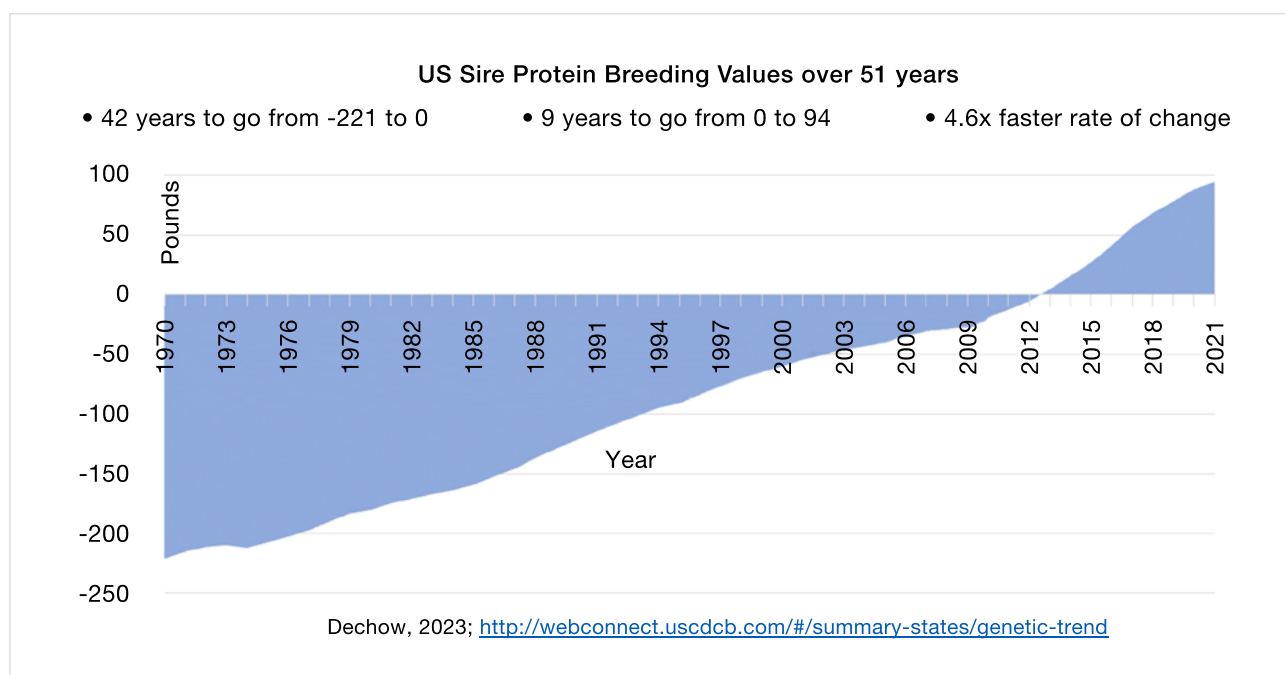
The Opportunities Ahead

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“Cows don’t need protein in their diet—they need amino acids to produce milk and body proteins. Feed them protein, and much of it breaks down in the rumen into nitrogen and amino acids, reforming as microbial protein. This microbial protein, the cheapest way to deliver amino acids, then flows to the hindgut for absorption by the cow. We maximise it by syncing energy and protein in the rumen. Add in bypass protein—stuff that escapes rumen fermentation—and you’ve got the cow’s metabolizable protein and amino acid supply sorted.”

A cow’s biology and genetics set the stage for her milk production potential. Thanks to genomics, the pace of genetic progress has accelerated in recent years, pushing that potential ever higher.

But are we feeding cows to match it? Today’s dairy cows can achieve more with better nutrition, yet their ability to physically consume enough nutrients lags behind their rising requirements.



Cows don't need protein as such—they need amino acids, the building blocks of proteins. Traditionally, we've overfed crude protein to meet these needs, a cheap and cheerful approach when nitrogen waste wasn't a worry. Times have changed. Protein quality, price swings, and environmental pressures now loom large. Enter rumen-protected amino acids (RPAAs). By targeting amino acid supply, we can boost yields of milk, protein, and fat—ultimately lifting energy-corrected milk or solids—while cutting waste and costs and improving farm profitability.

Modern rationing systems, like the Cornell Net Carbohydrate and Protein System (CNCPS), have shifted from crude protein to metabolizable protein, factoring in amino acid needs per unit of energy. This leap forward lets us tailor rations to a cow's genetic potential, reduce cost, or optimise milk contracts. Plus, there's a bonus: Balanced amino acids can improve health and fertility.

WHAT COWS REALLY NEED

Put simply, cows don't need protein in their diet—they need amino acids to produce milk and body proteins. Feed them protein, and much of it breaks down in the rumen into nitrogen and amino acids, reforming as microbial protein. This microbial pro-

tein, the cheapest way to deliver amino acids, then flows to the hindgut for absorption by the cow. We maximise it by syncing energy and protein in the rumen. Add in bypass protein—stuff that escapes rumen fermentation—and you've got the cow's metabolizable protein and amino acid supply sorted.

But here's the challenge: If an amino acid runs short, performance dips. Cows redirect amino acids from immunity, fertility, or milk protein to keep production humming, until output eventually stalls. In most European diets, methionine is first limiting—95% are deficient—followed by lysine.

STRATEGIES FOR USING RUMEN- PROTECTED AMINO ACIDS: SUBSTITUTION OR PARTIAL REPLACEMENT

Balance ration to increase MP-Lysine and MP-Methionine

Perhaps the most versatile and effective way to use rumen-protected amino acids (RPAAs) in dairy rations is to substitute or partially replace feedstuffs with lower levels of lysine and methionine with RPAAs, which offer higher concentrations of these essential amino acids. The benefits are numerous:

- Potentially lower ration costs,
- Space created for more energy or fibre,





- Using multiple ingredients dilutes the cost impact of a singular ingredient,
- Rather than reformulating with complex models—just swap 100 g of soya protein for an RPAA equivalent,
- Use sophisticated computer modeling systems to meet dietary nutrient requirements on a best-cost basis, lowering crude protein levels and reducing costs.

Success hinges on fixing any amino acid shortfall and by ensuring the correct ratios of lysine to methionine and amino acid per unit of energy. This creates space, allowing more energy or fibre to turbocharge genetic expression.

ADD THEM ON TOP

The most commonly used approach for feeding ruminant-protected amino acids is to simply add them in addition to or “on top” of the current ration being fed, with the goal of increasing milk and milk component production. Benefits of this method include:

- A visible production jump in component production with a clear return on investment if requirements are met,
- Simple and easy,
- More amino acids can unlock the cow’s genetic potential.

Drawbacks? More expensive, and you’ll need a solid performance boost to justify it—tricky to measure on busy commercial farms with endless variables. Getting lysine and methionine levels spot-on depends on knowing your feedstuffs and trusting models, which can be off if inputs like intake or ingredient analyses are wrong.

THE BOTTOM LINE

RPAAAs offer multiple paths to harness a cow’s biology and genetic promise. Start simple: Use them as ingredients to tweak rations, boost performance, and trim costs. As we chase higher-quality milk with less environmental baggage, you must contend with ingredients that vary in price, quality, and supply. RPAAAs—like AminoShure™-XM (38% metabolizable methionine) or AminoShure™-L (24.3% metabolizable lysine)—bring consistency and cost-effectiveness, stabilising rations in a volatile market.

In short, RPAAAs aren’t just about feeding better—they’re about feeding smarter. They align nutrition with genetics, letting cows shine while keeping farms profitable and green. With tools like CNCPS and products like these, we’ve got a significant chance to close the gap between what cows can do and what we’re helping them achieve.

About Dr. Sion Richards

Dr. Sion Richards hails from a farm in North Wales and holds a degree in Animal Science from the University of Nottingham. He furthered his studies at the same institution, earning a PhD in Nutritional Biochemistry. Thereafter, he worked for Provimi as a Commercial Ruminant Nutritionist and later as Research and Technical Manager. He then transitioned to the UK feed industry, taking on roles as a Technical Manager and Senior Dairy Cow Nutritionist. His expertise expanded during his tenure at DSM Nutritional Products, where he was the Senior Ruminant Specialist and Ruminant Markets Manager for EMEA. Following this, he joined Adisseo as the Ruminant Technical Manager for Europe. Currently, Dr. Richards is the Ruminant Technical Services Manager for EMEA at Balchem. With over 25 years of both practical and technical ruminant nutrition expertise, Dr. Richards brings a wealth of knowledge and experience to his field.

The Next Generation of Amino Acid Balancing

Consistent and Reliable

Increased Milk & Milk Components

Cost-Effective and Sustainable

AminoShure™-XM

Precision Release Methionine

AminoShure™-L

Precision Release Lysine



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