



Mintrate® Fill the holes in your forage.

There is a nutritional gap between what cattle need, and what forage provides. Mintrate products enable cattle to get more nutrients from forages while supplying other vital nutrients that forage lacks. This leads to elevated performance and forage utilization, adding value to your bottom line.

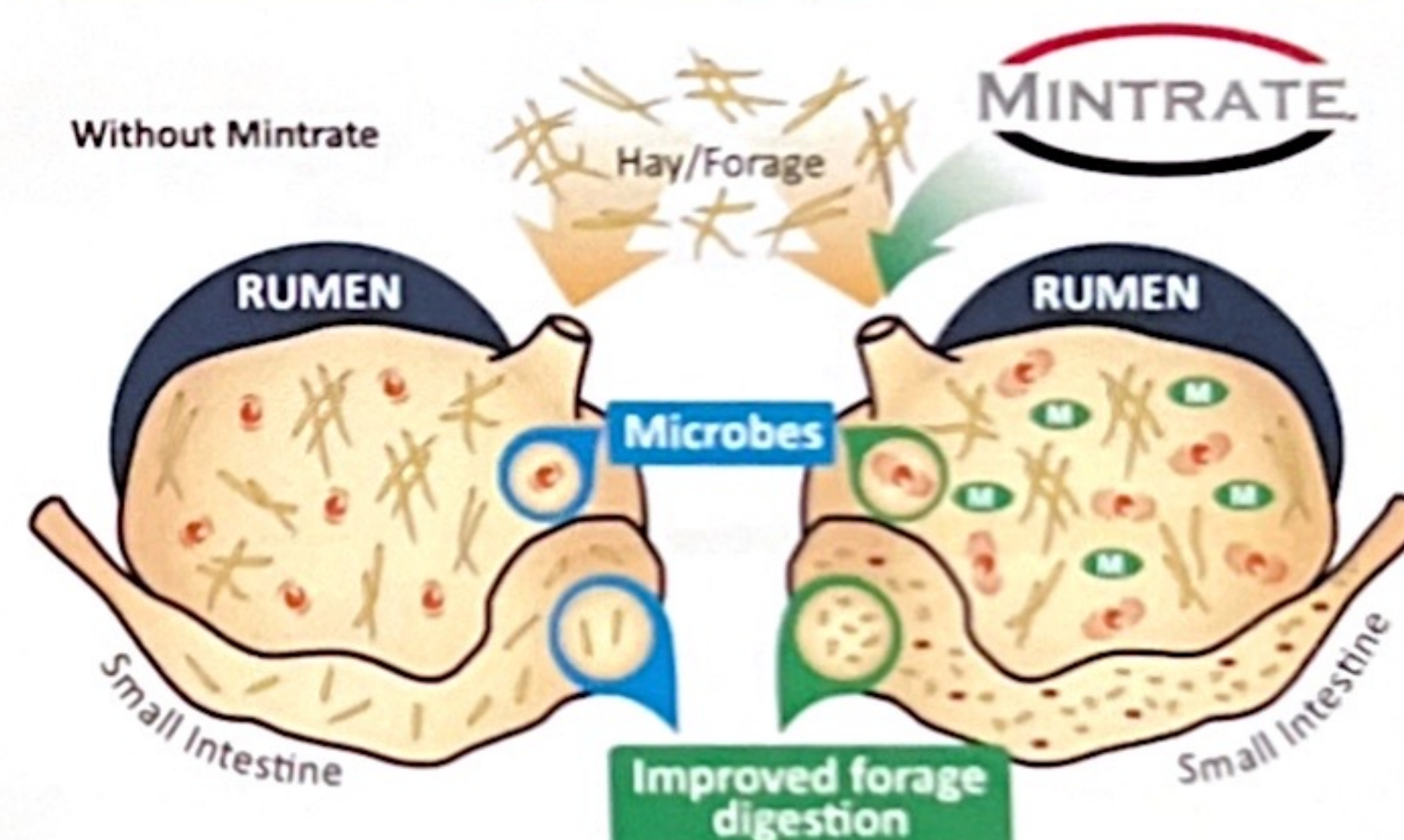
Mintrate ...

- Provides protein and mineral for more efficient production and performance at lower investment
- Maximizes rumen function
- Enhances reproductive efficiency
- Especially beneficial from late summer thru winter as forage protein content and quality continues to decline
- For cattle on forage-based diets - brood, stocker, replacement

Protein nutrition impacts effective and efficient forage utilization including growth, reproduction, lactation and maintenance.

Mintrate supplies the needed nutrition to help build solid herd productivity and supports future generations' potential. Mintrate's strength lies in its unique combination of protein sources. Building on protein is mineral technology that factors in bioavailability, rumen solubility, and interactions, along with essential vitamins A, D, and E, which can be lacking in forages.

FIGURE ONE Stimulating microbial activity



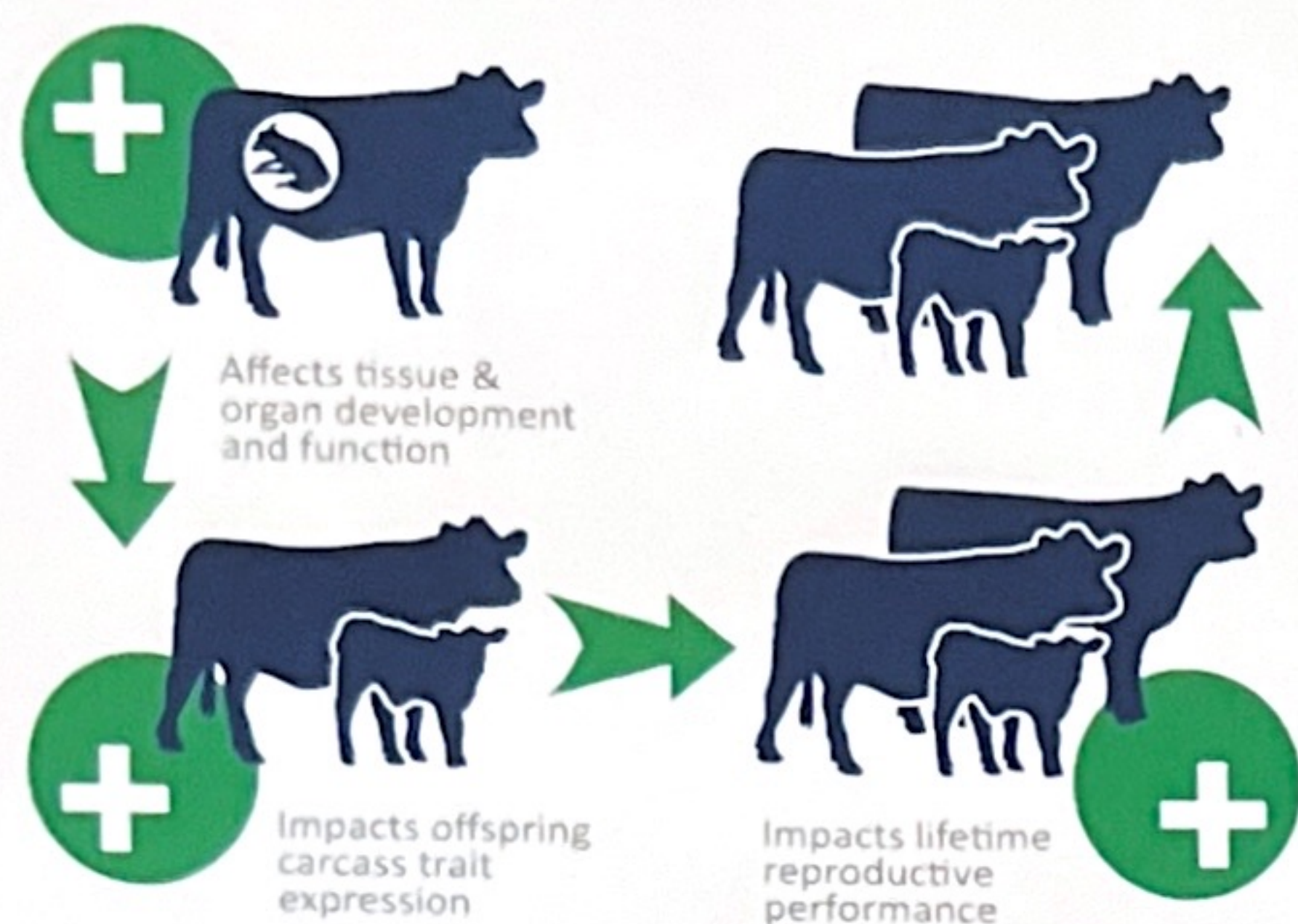
When **Mintrate** is added to the diet, the activity of the microbes increase and may result in 50%* more TDN supplied to the animal.

* Up to 50% improvement can be seen depending on forage quality and management scenario.

Protein — When forages, such as late summer and fall/winter pasture/range, lack what cattle need, supplementing with the optimal types and quantities of protein can make a huge difference in performance by supplying the building blocks to maintain and enhance growth. Rumen microbial population and function also benefit which improves forage digestion, supplying more energy to the animal (Figure 1).

Minerals — forages don't provide ample amounts and ratios. Minerals are vital to many physiological functions, such as the immune response, and certain minerals are crucial to the microbes' ability to break down forage, releasing energy for production purposes, and serve critical roles in metabolism.

Vitamins — Vitamins are crucial for reproduction, immune function, gene expression, and protein and energy metabolism.

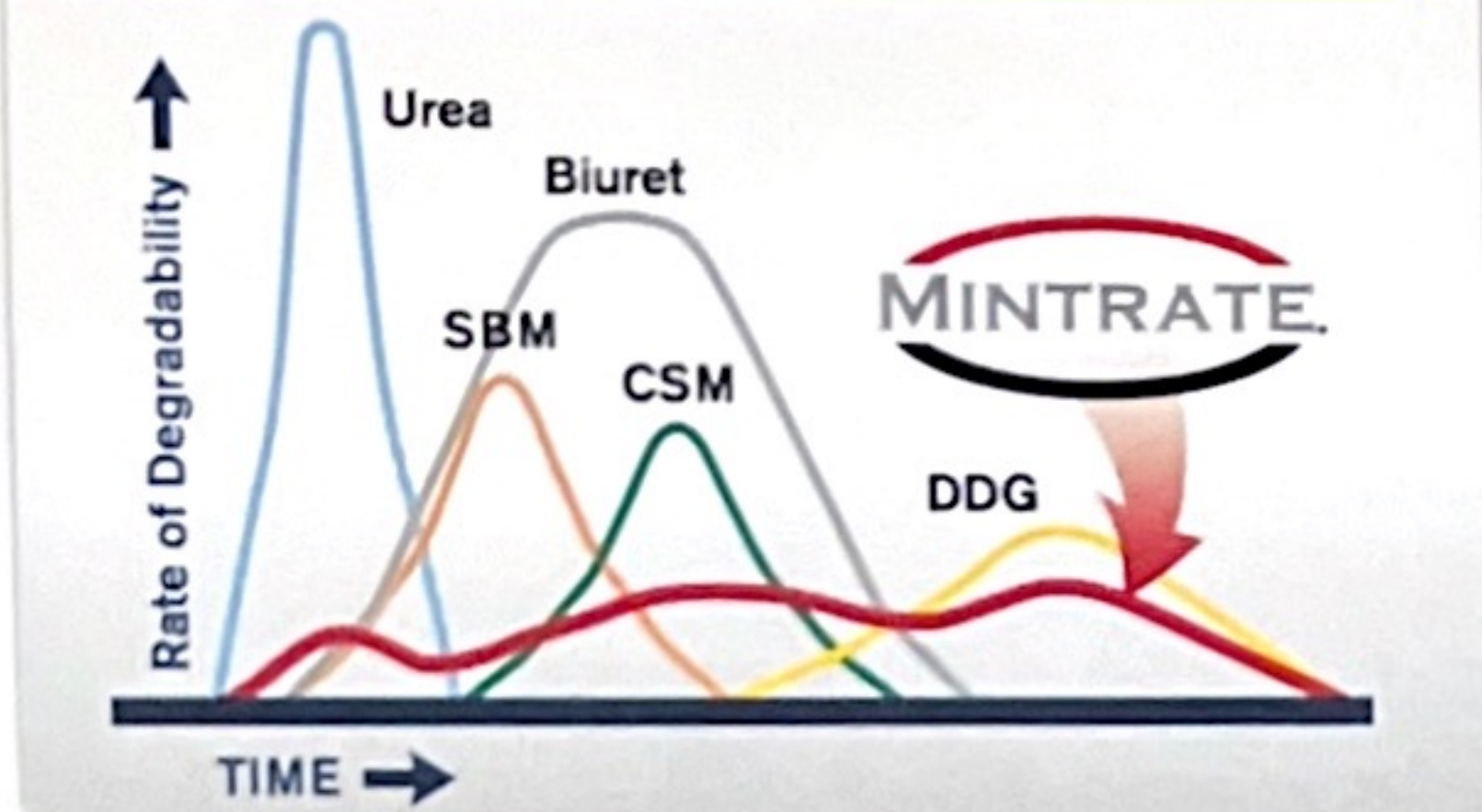


Mintrate supports future generation potential

Mintrate not only enhances the current herd's production, it provides the nutritional support needed to ensure the genetic potential of future generations can be attained. Nutrient deficiencies during every stage of pregnancy will influence the calf's well-being and production potential, and will impact the productivity of future generations. Consider the impact of nutrition on the gestating brood cow:

- All oocytes (egg cells) form 60-80 days after conception (impacts lifetime female reproductive performance)
- Carcass traits of offspring – lifetime muscle cell numbers are established and developed in the first and second trimester; intramuscular fat cells are developed
- Tissue development and differentiation occurs in the first trimester followed by organ formation and function in the second trimester

Figure 2: Mintrate Rumen Degradation



Unique protein and nitrogen profile

Protein nutrition for ruminants is complex and entails more than simply providing a source of crude protein. While much of the dietary protein in Mintrate is degraded in the rumen for microbial needs, the diversity of protein sources also delivers some protein that escapes degradation and bypasses the rumen which complements the overall protein package to the ruminant.

In addition to meeting animal needs, the combination of multiple protein and non-protein nitrogen (urea and biuret) sources and other important nutrients, like cobalt, help rumen microbes efficiently digest dietary fiber. The result is maximum rumen function, maximum forage intake, and optimal animal performance.

Mintrate products combine oilseed meals, co-products, urea and biuret to supply a unique protein and nitrogen profile that is converted to ammonia in a more constant and gradual manner to optimize rumen function.

Minerals Matter

Late season forages can lack essential nutrients. Matching mineral requirements to forage supply and cattle needs is a juggling act to meet physiological demands. Mintrate ...

- minimizes mineral antagonisms,
- accounts for the differing mineral needs of the rumen microbes and the cow,
- delivers proprietary cobalt (Table 1) to enhance rumen fermentation,
- utilizes 100% organic chelated trace mineral to support the animal's health, well-being and performance.

Mintrate is specifically formulated to take these factors into account without hampering mineral availability, rumen function and animal productivity. Mintrate provides the right amount of available minerals in the most cost-effective manner possible.

Table 1 Kansas State Study Using Proprietary Form of Cobalt (CoMax[®])

Parameter	Control	Proprietary Form of Cobalt
Overall Cow Body Weight Change, lb	52.6	62.3
Overall Body Condition Score Change (BCS Units)	0.07	0.37
Pregnancy to AI, %	49.0	57.6
Overall Pregnancy, %	89.5	92.7
Calf ADG — Late Season, lb	2.24	2.62
Adjusted Weaning Weight, lb	622	636
Overall Avg. Daily Mineral Intake, lb	0.32	0.34

*A registered trademark of Ralco Animal Nutrition

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