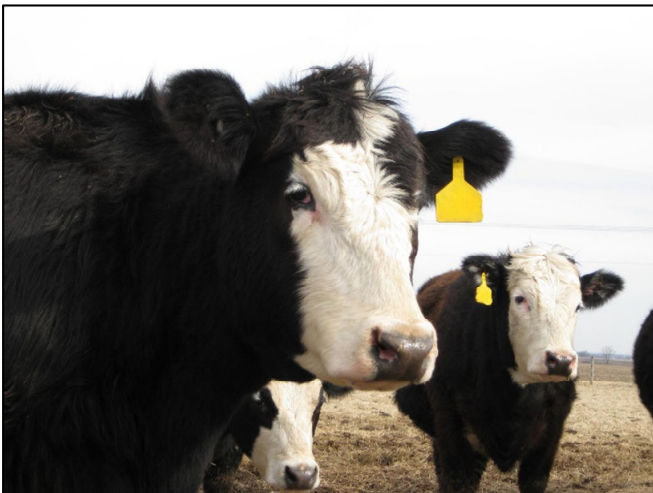




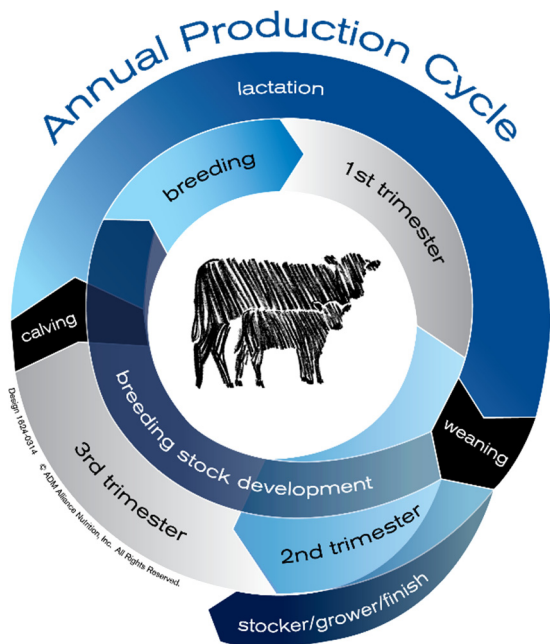
Roughage **BUSTER**

Get More out of Your Forage





Get more out of your forage for better production responses.



Roughage Buster[®] products are ideally suited for any cattle consuming mature or winter pasture/range forages or fed low-protein forages.

The ruminant animal, like the cow, is unique among animals in that it can convert forages to utilizable nutrients, enabling it to exist predominantly on pasture/range or harvested forages. To enable cattle to effectively and efficiently utilize the nutrients in forages the diet must satisfy the rumen microbial population's need for protein in a form they can digest – rumen degradable protein (RDP) – along with other nutrients.

Insufficient dietary RDP results in underutilization of forage nutrients because RDP is needed to support optimal rumen microbial activity and growth. A lack of RDP compromises performance potential, body condition score, and milk production.

The microbial population digests RDP, releasing ammonia-nitrogen which supports increased microbial activity, such as the digestion of forages, and microbial population growth. The end result is more energy is derived from the forages consumed and more microbial protein (high-quality source) is available to support production. This process also stimulates higher forage intake. The overall benefit is better productivity – gain, milk production, and body condition, which positively impacts reproductive efficiency.

It just makes economic sense to fortify the diet with minerals because forages don't provide ample amounts and ratios. Minerals are vital to many physiological functions, such as the immune response, and serve critical roles in metabolism and structural soundness. Certain minerals are also crucial to the microbes' ability to break down forage, releasing energy for production purposes.

Don't sell cattle performance short by ignoring vitamin needs that forages can't supply. Vitamins are crucial for reproduction, immune function, gene expression, and protein and energy metabolism

Providing cattle with a small amount of a high-protein supplement, such as **Roughage Buster**, can significantly increase available energy to the animal. **Roughage Buster** offers a very cost-effective supplementation strategy, yielding performance benefits while lowering supplementation costs in later production stages due to better body condition.

Roughage BUSTER

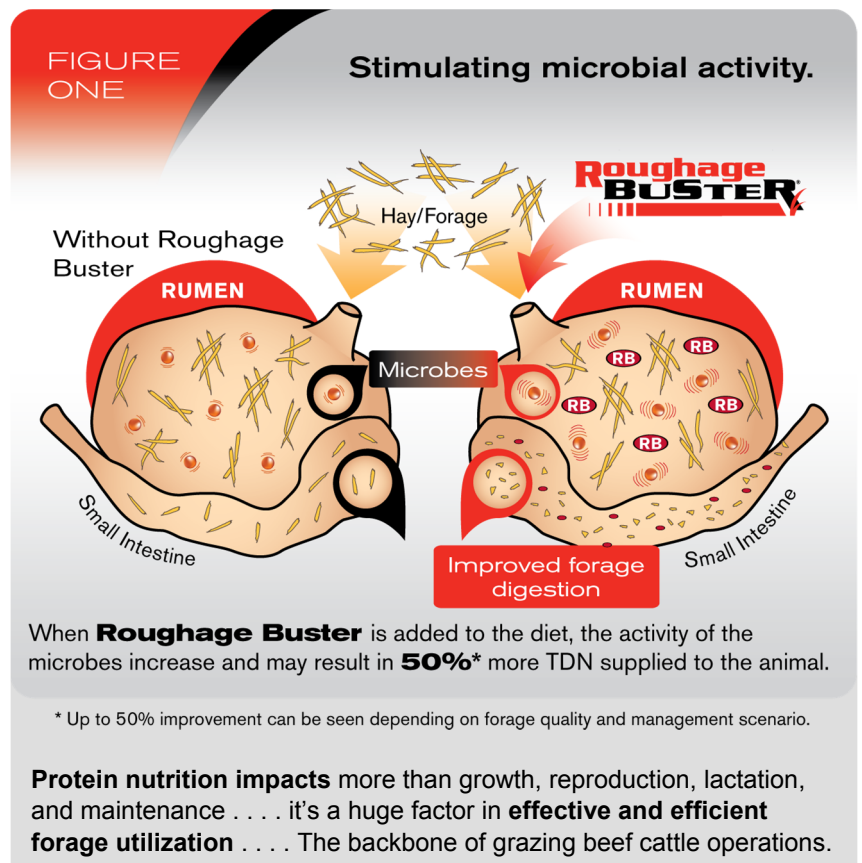
Get More out of Your Forage

Roughage Buster makes getting more production out of available forages easy. Roughage Buster is the ideal supplement to complement forages that lack sufficient RDP, such as forages in later stages of the growing season and forage residues.

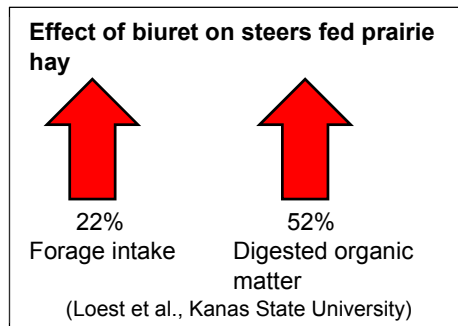
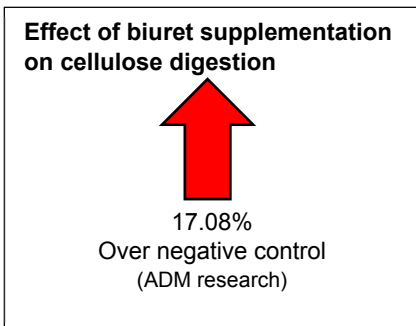
Roughage Buster's strength lies in its unique rumen degradable protein source, **biuret (an ADM exclusive non-protein nitrogen source)**, and mineral technology that factors in bioavailability, rumen solubility, and interactions. Adding to Roughage Buster's solid strength is the inclusion of vitamins A, D, and E.

Protein

When mature forages or forage residues lack sufficient RDP, supplementing with biuret provides the rumen microbial population with a source of slow-release ammonia-nitrogen over several hours, better fueling the rumen microbes' task of breaking down forages, releasing energy, and boosting the microbial population. Ammonia is the most critical dietary factor limiting the rumen microbes' ability to supply nutrients to cattle from mature or low-protein forages. Rumen microbial function and growth benefit forage digestion, supplying more energy to the animal (Figure One) and increasing forage intake.



Evidence Supporting Biuret



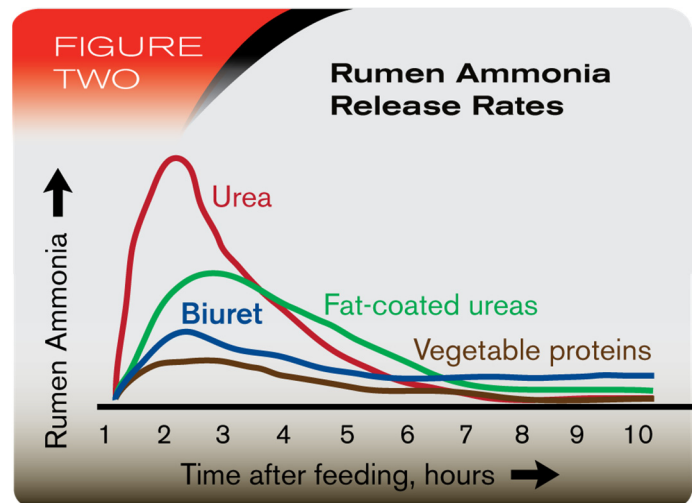
Winter feeding study

Biuret supplemented cattle maintained body weight and condition score; whereas, cows fed an 18% crude protein supplement lost an average of 62 lb body weight per head and dropped ½ body condition score.
(Montana State University)

Biuret Benefit

Protein nutrition for ruminants is complex and entails more than simply providing a source of crude protein. Most of the dietary protein, predominately biuret, in **Roughage Buster** is gradually degraded in the rumen for microbial needs. Ammonia is slowly released from biuret with a release rate similar to vegetable proteins (Figure Two), which allows cattle fed high-forage diets to make more efficient use of forage compared to a supplement that contains a high amount of urea. The slow release of ammonia makes it a very safe form of non-protein nitrogen (NPN) and supplies rumen microbes with a sustainable, continuous supply of nitrogen to fuel microbial digestion of forage, releasing more energy for growth, lactation, reproduction, and maintenance of body condition.

In addition to meeting animal needs, biuret 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.



Minerals

Matching mineral requirements to forage supply and cattle needs is a juggling act. One must account for:

- Mineral interactions
- Antagonistic attributes of some minerals
- Differing mineral needs for rumen microbes and the cow

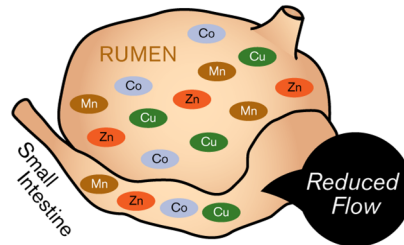
Roughage Buster

formulations take these into account without hampering mineral availability, rumen function, and animal productivity.

FIGURE THREE

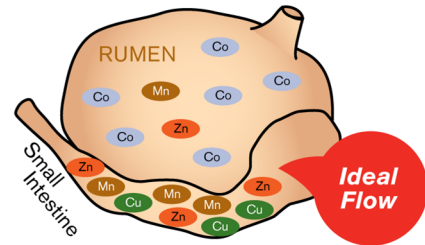
Scenario of Trace Mineral Flow into the Ruminant's Small Intestine

Typical Beef Supplement



With the typical beef supplement, the flow of critical trace minerals to the small intestine is reduced due to the solubility of the trace minerals in the rumen.

Roughage BUSTER



The minerals in Roughage Buster make it possible to attain a more ideal flow of critical trace minerals to the small intestine.

Roughage Buster supplements are formulated to deliver specific sources of minerals . . .

- Do not duplicate what's already supplied in the forage
- Utilize highly bioavailable mineral sources, reducing the potential for over-fortification
- Utilize magnesium carbonate for its natural palatability plus higher bioavailability
- Do not interact with other biological substances
- Provide critical minerals that bypass the rumen to avoid rumen antagonists and limit microbial interactions
 - Trace mineral package ensures optimized amounts of minerals are absorbed as cost-effectively as possible. Rumen bypass hydroxy copper, zinc, and manganese (Figure Three) allows for better absorption
- Utilize a patented source of cobalt to provide rumen microbes with the cobalt needed for efficient fiber digestion. And, since forage is the base for grazing beef cattle diets, enhancing forage utilization could be profitable to the bottom line (Table One)

Table One

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.

Ralco Nutrition, Inc.



Roughage BUSTER



Get More out of Your Forage

Key benefits of Roughage Buster:

- Most Roughage Buster products are designed for free-choice feeding
- Enables maximum forage intake, digestibility, and forage energy utilization, optimizing cattle productivity
- Gradual release of biuret (an exclusive, safe NPN source), which facilitates better utilization of forages for greater economy of production
- Mineral package is conducive to fiber digestion and animal needs by providing the correct amounts and ratios of minerals to balance forage deficiencies and support animal needs through use of technologically-advance mineral sources
- Supplies vitamins that maybe lacking in mature forages and forage residues
- Manufacturing technology sets industry standards for quality and consistency
- Available in range of varying crude protein contents to fit forage conditions and cattle needs
- Optimal amount of supplemental nutrient intake supports economic benefit
- Choice of product forms to meet producer feeding preference – blocks, tubs, cubes, and loose mix
- Formulations are also available with IGR for horn fly population control and Endo-Fighter® to help counter the harmful effects of fescue toxicosis

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ADM Animal Nutrition™, a division of Archer Daniels Midland Company
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