



PRIORITY REPORT

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For Healthy Cows®

Microbiology Nutrition: How the Rumen Works

The rumen is the vehicle of dairy cattle digestion and microbiology is the driver. The speed and rate of fermentation in the fermentor (rumen) impacts cow performance – Microbiology is the driving force at the wheel. As the epicenter of the cow, if the rumen is slightly off everything is impacted.

Priority IAC understands and applies microbiology to manage the complexity of the rumen; thus, Priority is able to provide a simple approach to nutrition and a simple feeding approach to maximize the rumen's efficiency by realizing and applying Microbiology Nutrition. To understand more on Microbiology Nutrition and how the rumen works, we sit down with Richard Breunig, President and Founder of Priority IAC; Lindy Riesterer, Microbiology Nutritionist; and Ken Schneider, Microbiologist and Nutritionist.

Microbiology Nutrition:

How does microbiology impact the rumen?

Richard: Microbiology Nutrition allows us to rethink everything the industry believes it knows about feeding cows. Microbiology Nutrition is the basis of rumen function.

Ken: The rumen is a fermentor. Fermentation is driven by microorganisms. We have the microorganisms that can keep the rumen environment and pH balanced as it should be.

If a cow goes to the field and eats too much grass, she'll back off her intakes to self-regulate until her rumen becomes right again. We give the cows the right bacteria with the P-One Program™ so she can handle it – She can eat a high fermentable fiber, energy dense diet and not need to back off.

Richard: Rumen pH maintenance is everything. **Smartbacteria** stabilize and maintain rumen pH because they perform specific jobs in the rumen. **Smartbacteria** breakdown complex carbohydrates to simple sugars to glucose to lactic acid to VFAs.

Ken: As the rumen grows more bacteria, you need to make sure to feed them. If the pH drops your fermentation goes off track. The microorganisms will be breaking down the forages, releasing the sugars. As that glucose starts to build, if you don't have enough microorganisms and the right ones in the rumen, the fermentation can shift to alcohol or your pH will drop and become acidic.

Richard: With an abundance of selective workers that thrive on these carbohydrates, fermentable fiber and starch; as intakes and other variables bounce around on the farm, the **Smartbacteria** keep the rumen stable. With the abundance of the **Smartbacteria**, the cow's rumen can handle the variable loads.

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Richard Breunig:

Richard, as a self-taught entrepreneur, founded Priority IAC, Inc. in 1998. Priority IAC is a farm-developed concept, family-owned company bringing this invention and technology directly to producers. As a dairy producer managing the world-renowned Clover Mist Farms, Richard saw firsthand the impact of microbiology on animal health and brings this knowledge and power directly to producers.



Lindy Riesterer:

Lindy is a Microbiology Nutritionist at Priority IAC. She brings experience directly from her farm, applying microbiology to ration formulation. Having been a part of her family farm 17 years prior to being the herd manager for a 900-cow dairy, Lindy is intimately connected with the dairy cow and the changes the dairy industry has faced. Additionally, she brings a perspective on cattle health having managed a veterinary clinic for 10 years working directly with farmer call-ins, lab diagnostics, and cultures.



Kenneth Schneider:

Ken brings 28-years of fermentation experience to Priority IAC, having specialized in growing unique microorganisms in laboratory fermentors. By understanding the function and interactions of the microorganisms, Ken would fine-tune the nutritional variables and environmental conditions, like pH, to improve their growth and ability to produce specific metabolites. His next steps with Priority were applying his many years of fermentation and microbiology experience to the rumen, the fermentor that is in every cow.

Ken: Yes, we have the right bacteria.

Richard: The microbiomes are so different from cow to cow and yet the cows are fed the same ration, that's why cow health and cow performance are so variable. Reproduction and hoof health have deteriorated over the past 20 years and are indications that rumen fermentation is not being maintained. If the gut is not right, every aspect of health will fail, human and animal alike.

Another benefit of **Smartbacteria** is the ability to make the microbiomes similar from cow to cow to respond similarly to the ration that is fed. Then one can maximize the rumen – Maximize carbohydrates from fermentable fiber, starch, and sugars; rather than fat and protein sources. Then the ultimate outcome: Maximized microbial protein.

Why is P-One™ the first ingredient?

Richard: Everything starts with pH. Any fermentation, every rumen, needs a stable pH first before moving on. Then it needs carbon and nitrogen as food for bacteria growth.

Ken: In simple terms, the feeds are changing and every rumen is different. We are adding bacteria that we know will keep them stable. You have to have it as the first ingredient to maintain pH. With that understanding, the first ingredient is spot on. The cow cannot use the feed without the right bacteria. It has to be broken down into a form that the cow can use.

How did Microbiology Nutrition come to be?

Richard: Simple, everything eats something and makes something.

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Hot Topic: Feed shortages

Why do some think they cannot feed an all corn silage diet?

Lindy: History. They're traditional. Your father didn't do it, your grandfather didn't do it – The industry believes that what they were taught is the only way to do it. The perception is that one needs to have haylage or hay with it.

What Priority does is different, it's not what the industry does.

Richard: Corn silage is a forage, no different than any other forage. Corn silage has a much higher percentage of forage fiber than corn per pound. I think there is a belief corn silage is all corn, but it's not. Less corn is required in the ration as the silage contains corn as part of the forage. The ration may require additional protein and minerals – Pretty simple. It does not need to be complicated.

Lindy: Right, corn silage is a forage. I think some may think it's corn, an energy.

Ken: They feel it's only starch so one needs to add some protein or additional forage. They believe that corn silage is only energy and that they need to add some hay or alfalfa.

Lindy: They want hay for the protein, but you don't need the hay.

Ken: We know fermentable fiber is energy and brings energy and protein, grown from bacteria.

Richard: These bacteria do their work using carbohydrates (starch, fermentable fiber, sugars, and silage acids) as their food, making usable energy (VFAs); when finished, they die (or lyse). They are protein for the cow, known as microbial protein and provided at no additional cost.

Does everyone recognize corn silage is a forage?

Lindy: I grew up with the idea that alfalfa, grasses, legumes those were your forages and corn silage wasn't, it was energy.

Ken: So what is the stalk and leaves then?
What about the rest of the plant?

Lindy: Before I came to Priority, I don't think I really thought about the stalk or plant – It just came with the corn. Just some extra filler.

Richard: The industry sees corn silage as not really a forage, but the stalk makes up 60-70% forage.

Lindy: Nobody told me when I was working with cows that adding corn silage to the ration can bring in that protein to the cow. And it's not because it contains protein, but because it can make protein in rumen fermentation.

Richard: When the rumen pH is balanced, more microbial protein is made. The rumen can make an abundance of its own protein at a very rapid rate when fermentable fiber is provided. As the forages get better each year, these forages provide more energy in terms of fermentable fiber. The rumen uses these to make its own protein; thus, MUN's may actually increase.

Ken: If the rumen fermentation is right, corn silage can be the food source to make a lot of protein.

Does the rumen need multiple forages?

Richard: The thinking that there is a fiber difference in grass to alfalfa to corn silage is incorrect; each have a portion of wood fiber (ADF) and fermentable fiber. An all corn silage ration is possible. Just one forage source to balance and less forage sources exposed to potential spoilage.

Lindy: And you have less work, thus less to manage.

Ken: Richard, it took you ten years of trials at Clover Mist to find the right bacteria. Bacteria that could do the jobs in the rumen, on the farm in the real world.

Richard: You're right. The majority of organisms I tried didn't work.

Ken: The lab looked for specific traits like those that converted starch and soluble fiber to glucose. It all started in the lab with lots and lots of rumen samples. Comparing their performance, searching for different categories and characteristics. Richard would then get samples to test at the farm.

Richard: The herd losses and health issues after the grain mix formulation error was the start of a ten year long trial. Not an easy process. Not much of the bacteria tried on the farm worked. Clover Mist was my research farm. That's why I encourage producers to see their farm as their research and truth.

There are trillions of organisms to sort through that led to the finding of our **Smartbacteria**. They make an end product that is beneficial to the animal or their digestive process. The conveyors/digestion are moving in unison, it's an illustration of efficient rumen fermentation.

Variable intakes and moistures vary the load and speed. The fermentation process is continuous. It's all done with the right organisms and right population of organisms to keep those conveyors in unison. Any imbalance can cause stress and disrupt the conveyors.

Ken: We have two categories. The first breaks down the fermentable fiber and starches efficiently to energy in a form that can be utilized – Two of these strains are A4000h™ and A2020™. The other category is the lactic acid utilizing bacteria which the Prop1-IAC™ does very effectively.

Strains make a difference. Some are more efficient at doing the job. We've identified the right bacteria to do that. That's what Richard observed on the farm.

Richard: What works in the laboratory or in a lab study doesn't necessarily work on the farm. The dairy should be viewed as a producer's research facility. The cows provide the truth – Microbiology Nutrition is the truth.

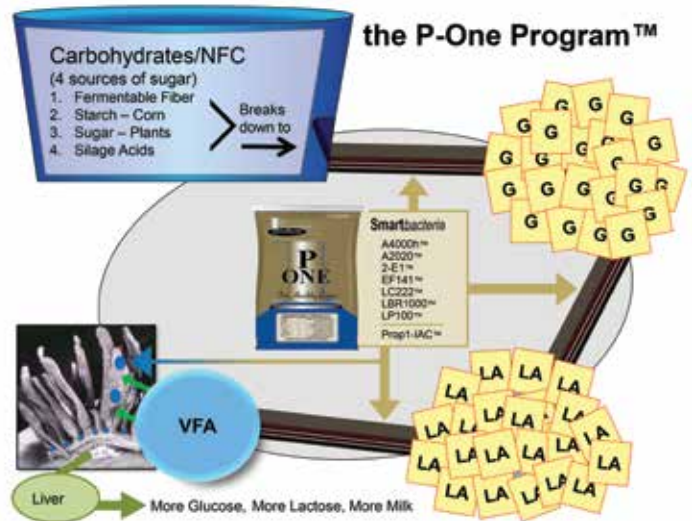
Lindy: Yes. Producers have their own research facility. The cows tell them what does and doesn't work.

Can Microbiology Nutrition change the way cows are fed?

Richard: I've seen rations with as many as 28 mix ingredients. Why?

Lindy: The rations we receive from new accounts have everything, but the kitchen sink in them. A laundry list of ingredients.

Richard: When you look at the basics, the base of how the rumen really works - It's microbiology. But this basic understanding has been lost.



Lindy: Has it been lost? Or has it never been really understood and appreciated to this level?

Have forage advancements impacted the rumen?

Richard: The digestive system is key to universal function. Plant breeding has advanced. Harvesting early maturity and wetter has yielded a higher amount to ferment and quicker. We get higher production levels, but concede animal health.

Straw is being used to counter fermentable fiber. This doesn't make sense. Straw is wood, wood fiber. It's expensive, doesn't get digested, it is simply taking up space in the rumen and acting as a pass-through.

Ken: We have a way to manage it through microbiology so we don't need the straw in diets.

Is there a benefit to driving intakes?

Richard: Driving intake is not economically efficient anymore. Rather, we want to drive ration density, feeding the highest percent that is fermentable so the highest percent of what goes in the rumen gets used. This is done with the use of Microbiology Nutrition.

Ken: Adding straw is just taking rumen space, limiting the amount of quality feeds one can feed. Do you want to spend money on feed that has no nutritional value?

Richard: Driving intakes is not efficient.

How does Microbiology Nutrition make the rumen more efficient?

Richard: Driving intakes is expensive. Feeding for refusals adds to the expense. Ration density versus driving intakes is a difficult concept to understand.

Feed efficiency is minimizing the feeding of wood fiber; thus, reaching energy needs quicker, with less. There is no need for uNDF, which is indigestible fiber or ADF (acid detergent fiber).

All possible with **Smartbacteria**.

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Lindy: That is where managing resources, managing your margins comes in. Manage your intakes. There isn't going to be more land for us to grow feed on. Producers need to make the most with what they have.

For me, understanding density is about understanding what it is not. I thought it was a lot of corn. I thought it was about a lot of fat. Because of the forages available today, the fermentable fiber and carbohydrates, you can get a dense diet without using a lot of corn.

Ken: If you look at high dry matter intakes and the amount that doesn't get used versus an energy dense approach, the energy dense diet has a small amount that the cow cannot use.

Lindy: Your manure pit isn't getting filled up with unused fiber, uNDF.

How does the rumen make its own protein?

Ken: You need carbohydrates to grow more bacteria; more bacteria, the microorganisms in the cow are providing protein. Calories and fat do not grow bacteria, you need carbohydrates for the rumen to make protein. And then, you don't have to add so much protein to the diet because the cow is making it.

And the key to this all is the microorganisms are making the best protein – Amino protein.

Lindy: There are so many mixes loaded with fat and protein, they aren't letting the rumen work the way it should.

Richard: The industry does nutrition with the fear of acidosis and subacute rumen acidosis, replacing carbohydrates with purchased fats.

Ken: Fat is an energy source for the cow, but you aren't going to grow bacteria with it. And if you aren't growing bacteria, you're not providing the most benefit for the cow.

Does the rumen need particle size? Scratch factor?

Richard: The smaller the particle size, the better the fermentation quantity and rate. Anything placed in the rumen box that doesn't get used is expensive as it is expelled as manure waste. There is no scratching in rumen fermentation.

Lindy: No because the cow is going to chew it up anyways.

Richard: The cow goes to pasture and eats the top of the plant or the soft, young grass. Her actions show they want fermentable fiber, not the wood.

Lindy: Why would you want to harvest brown, mature, tall feed when you could have the green, lush, short and wet? What would the cow choose to eat? Why can't we make forages like that?

Richard: Nutrition needs an overhaul using Microbiology Nutrition as the basis to nutrition.

Opportunities Available

Call for details.



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MEETING EVENTS...



Meetings to bring Producers together to Think Differently, using innovative Microbiology Nutrition

To find a meeting in your area, Contact Priority IAC office at 1-888-444-2030, visit our Facebook page at Priority IAC, or contact your Authorized Reseller.