



Quick Facts

1. The active component is the bacteria *Propionibacterium acidipropionici* strain P5.
2. Strain P5 was originally isolated from rumen fluid and is capable of colonizing at significant populations in the rumen.
3. Original research on strain P5 was conducted at Oklahoma State University.
4. In that research it was shown that strain P5 metabolized rumen nitrate and nitrite into harmless nitrogen gas.
5. Research showed a reduction of up to 45% of rumen nitrate and nitrite and a similar reduction in final blood methemoglobin levels when high levels of nitrate were present in feed. Studies included rations with 10,000 ppm and 20,000 ppm of nitrate present.
6. Oklahoma State University Extension recommends strain P5 as a tool for managing high feed nitrate situations that result from drought stressed plants.
7. Strain P5 must be established in the rumen prior to the animal consuming high nitrate feeds. This establishment period is generally considered to be about 10 days.
8. Bio-Vet offers two products containing strain P5 which may be considered for management of high nitrate feed situations. One product is a capsule to be administered to individual animals (128 capsules per box). The second product is a concentrated powder which can be administered to individual animals or mixed with the ration (1 kg concentrate powder per bag).
9. These products are considered "custom order" for Bio-Vet. They are labeled with a customer label for each individual order. For example "ACME Vet Clinic Custom *Propionibacterium acidipropionici* strain P5 Capsules" or "ACME Cattle Ranch Custom *Propionibacterium acidipropionici* strain P5 Concentrate".
10. Each capsule contains 2 trillion colony forming units of strain P5. Standard recommendation is one capsule per animal weighing over 500 pounds administered orally 10 days prior to feeding high nitrate feeds.
11. Concentrate powder contains 100 billion colony forming units of strain P5 per gram. Two different methods of feeding the concentrate powder are recommended. The first method is to mix 2 grams of the powder with a small amount of dry ground grain and allow each animal to consume it once daily for 10 consecutive days prior to feeding high nitrate feeds. The second method is to mix powder with the normal TMR at the following rates for 10 consecutive days prior to feeding high nitrate feeds.
 - a. Stocker cattle (up to 600 pounds BW) = 2 grams concentrate per head daily for 10 days. (2 trillion colony forming units total)
 - b. Brood Cows and cattle over 600 pounds BW = 4 grams concentrate per head daily for 10 days. (4 trillion colony forming units total)
12. The reason for the higher feeding rate for larger cows with the TMR is there will be an unknown loss of bacteria sitting in moist feed prior to the animal consuming it, variable mixing and consumption times on various animal operations and variable consumption of the TMR by individual animals.



Frequently asked questions

Is this strain P5 product the same as Bova-Pro®?

YES. In fact, the culture offered by Bio-Vet is fermented by Lallemand Animal Nutrition who trademarked the Bova-Pro® name. The culture comes to Bio-Vet labeled as Bova-Pro®. Since Bio-Vet does not have a written license from Lallemand, we do not use the Bova-Pro® name on our products. Bio-Vet's capsules are the same potency as previous Bova-Pro® Cow Capsules offered for sale by Agtech. Bio-Vet's concentrated powder is twice the potency as previous Bova-Pro® Concentrate offered for sale by Agtech.

Why all the changes?

Research staff at Agtech Products were some of the same researchers that conducted studies on strain P5 when they were previously on the faculty at or attending OSU. Therefore, Agtech entered into agreements with Lallemand Animal Nutrition to market Bova-Pro® brand of strain P5. Agtech was purchased by Danisco Animal Health a few years ago. Subsequent to that purchase, low volume cultures such as strain P5 were phased out for general sale. Bio-Vet has been a long time customer of Agtech and Danisco, and has been using strain P5 since the early 1990s. Bio-Vet also has the capacity to fulfill many low volume product lines. As such, Bio-Vet has offered to take over low volume products that no longer fit the Danisco product line. Thus, Bio-Vet is offering strain P5 for general sale.

What levels of feed nitrates can strain P5 handle?

The Oklahoma State University research was conducted on feeds containing 10,000 ppm and 20,000 ppm of nitrate. Results showed strain P5 was able to keep animals from dying from nitrate toxicity at these levels. Bio-Vet follows the dosage levels utilized in that research, thus it would be prudent to use strain P5 for nitrate levels up to 20,000 ppm.

What about reproductive effects from nitrate toxicity?

The published OSU research only looked at death and ruminal and blood impact of nitrate. It did not look at abortion rates or other conditions for which nitrates may be a factor. Field results over the years indicate strain P5 appears to help lower abortion rates when nitrates are present. The nitrate levels at which this happens is not clearly defined and none of these field results are published at this time.