



## Fortifying Silage Fermentation

As the value of silage increases, inoculating gains importance

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The return on investing in silage inoculants could be higher than usual this year, suggests Rich Muck.

“Now with silage running more like \$50 or \$60/ton, it’s pretty easy to recommend a homofermentative inoculant just from dry-matter recovery,” says the ag engineer with USDA’s Agricultural Research Service, based at the U.S. Dairy Forage Research Center in Madison, WI. “But the big return comes in animal performance.”

Homofermentative, or standard inoculants, produce a high amount of lactic acid from fermenting sugars in forage that help preserve it.

Studies show that those inoculants, including *Lactobacillus plantarum*, *L. casei*, *Pediococcus* species and *Enterococcus faecium*, can average a 2-3% improvement in dry-matter recovery. A grower would need a price of \$40/ton of [silage](#) and a 2.5% gain in dry matter to break even, Muck figures.

Animal performance can increase by 3-5% using these inoculants. If milk production improved by only 1.5 lbs milk/cow/day, with \$10/cwt milk that’s an increase of 15¢/cow/day. “So if you’re up at \$20/cwt milk, now we’re talking about 30¢ income for an inoculant that only costs about 3¢/cow/day (at \$1/ton treatment cost),” he says.

Although there’s usually less economic value in inoculating [corn](#) silage because it ferments well on its own, Muck says, he could see how dairy nutritionists may want it done this year. “Back when it was \$30/ton as-fed, it may have been a little tougher to call. But now, at \$50-60/ton, I can see where it would be very easy to recommend homofermentative inoculants for cool-weather conditions.”

**It doesn’t pay** to apply a *Lactobacillus buchneri* inoculant in those same cool-silage conditions, no matter what the silage. *L. buchneri* not only costs \$1.50/ton, Muck estimates, it also produces acetic acid, which can cause some dry-matter loss compared to standard inoculants.

“You really have to get improved animal performance” to get a return on that investment, he says. “But with *L. buchneri* products, you really aren’t going to get any animal benefit if the silage would normally be cool.”

It will pay if silage is feeding out hot, Muck says. A 4-lb reduction in feed intake is reasonable to expect in that situation and can cause a 3-lb/cow/day milk production loss, research has shown.

“It’s a big return on your investment if you’re avoiding heating, because when you pencil that out, you’re talking about 30¢ more milk per cow per day at \$10/cwt. And it’s costing you about 4.5¢/cow/day.”

**A third type** of inoculant that combines the homofermentatives with *L. buchneri* is also available.

“The idea here is to improve bunk life by putting *L. buchneri* in, but also improve dry-matter recovery and animal performance by putting homofermentative products in.”

But combination products are about twice the cost of standard inoculants. Although several small-scale studies by inoculant manufacturers show animal performance increases, Muck feels it’s too early to tell if the combination products are effective.

“I would want to be sure that this improvement in milk production is happening on a routine basis. You may be more profitable if you used a straight homofermentative product for winter-time corn silage, for example, and then used a combination product, or just *L. buchneri*, for the summer when you want stability.”

The additive propionic acid can also improve bunk life or aerobic stability of silage.

“Plenty of corn silage, in the summertime, may be cool coming out of the silo but then, over the course of a day, start to heat in a feedbunk,” he says. “Typically, you try to increase your feed-out rate, or propionic acid is helpful in keeping silage cold.”

But propionic acid is generally more expensive than *L. buchneri* and can be applied at chopping, when a producer isn’t sure whether the silage will heat or not. However, it will only show a [return on investment](#) if it prevents heating, he says.

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