Microbes Munch Away On Manure's Smell

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Manure happens.

And because of that very normal and natural fact, livestock farmers often find themselves between a rock and a hard place.

The challenge of what to do with cow manure is not a new issue. Growing up on a small Dane County dairy farm, my brother Don and I - and our dad - were always faced with the manure challenge.

In those days we pastured the cows during the summer but that didn't mean there was no manure in the barn - our cows never understood that we wanted to keep the barn clean.

During the winter we shoveled the manure by hand from the barn gutters into the manure carrier, a small square metal container with a round bottom that ran on a track suspended between the barn gutters.

The track ran out the rear of the barn where we dumped it into the manure spreader if it wasn't too cold and we could get into the field. Most winter days we pushed the carrier up a steel cable attached to a long pole and formed a pile that got bigger day by day.

Come spring we loaded that pile, fork by fork, into the spreader and fertilized the fields. It seemed like a big job at the time and I guess it was but dad paid us each 10 cents a load, which amounted to $8 apiece.

I'd bet that today piling the manure in the barnyard all winter would violate the environmental laws. We didn't have a concrete lagoon, just a gravel barnyard. I don't guess it hurt the soil; I visited the home farm a couple of weeks ago and the long gone manure pile site is flourishing with grass and weeds and the house drinking water is pure.

But times have changed on the nation's dairy farms. Our small dairy had only 15 cows, so there wasn't that much manure. Today 15 cows are hardly even a hobby farm and our whole manure pile is about what a modern dairy would produce in a day or so. And we didn't have nearby neighbors (other than farmers) to complain about the odor. And I assure you, there was an odor.

For decades dairy farmers have tried about everything to solve the manure challenge. And they've done a good job of it.

Most still spread it on farm fields on a daily basis. The dairies with more cows store it in tanks or lagoons to be spread later and over a short time period. Some inject it into the soil. Others run it through an irrigation system. Microbes are sometimes used to break down the fiber. Increasingly, separation systems are being used to convert the manure to gas that can be burned for making electricity.

And a few farms are using incineration.

The problem? As yet there is no single, inexpensive, never-fail system to instantly remove the odor from manure so as to satisfy the most sensitive nose or to comply with the myriad of environmental protection rules that are in effect or a'coming.

But dairy farmers continue to seek solutions and they spend a lot of money in the effort. Bill Campion is an innovator and entrepreneur who has developed Pro-Act Microbial,

his Rhode Island company that features "Manure Munching Microbes."

With Campion's system, the solids in the manure lagoon are turned into a food source for the special microbes added to the manure mixture. The result is less fiber and more water, greatly reduced odor and a change in available nutrients.

My knowledge of microbes and such is rather limited so I accepted Campion's invitation to see how his system works at the Wagner Dairy at Middleton.

The five Wagner brothers and dad Jerome have milked over a thousand cows for a good many years. They have tried a number of manure handling systems (and spent a lot of money) to achieve a high quality flush water from their barns. Nothing worked to their satisfaction until they began using the Manure Munching Microbes.

The day I visited Wagner Dairy, manure was being pumped from the high solids lagoon by a commercial manure hauler and being spread on fields some distance from the farm. At the same time, the liquid lagoon was being emptied via a -mile-long hose. The removed contents were then being applied to a farm field.

I really didn't smell anything, which was a bit of a surprise as I was within a few feet of both operations. Jerome Wagner and his son Tom were most pleased with the results; they had finally found a system that seemed to work at a much reduced cost.

I've been around too long to believe in miracles, so I did some asking.

Campion had worked in the petroleum business with underground tanks and pipes. But contaminated soil remained after the removal of the contaminated tanks and pipes. What to do?

In one system, microbe additives ate the hydrocarbons (in the right combination of conditions) and cut the soil removal costs.

"I learned a lot about microbes," Campion says. This led him into working with septic systems and with a hog farm in Canada. The 1,500-sow operation was using microbes and had little odor and no flies.

"This was really something, I thought," he says. "And I made the decision to pursue animal agriculture."

Campion started as a one-man company with microbes he purchased. He began experimenting with different "bugs" and additives and began adding air to the process. Bill Donohue, Campion's partner, joined the company 3 years ago. Dr. Chuzhao Lin, who has a Ph.D. in microbiology from the University of Illinois, later joined. "She had worked with cows and waste treatment," Campion says.

The result is the product the company sells today.

"Just adding microbes doesn't work," Campion says. "The right microbes and addition of air through a diffuser make the difference."

When all is said and done, the manure in the lagoon ends up in three layers: and anaerobic layer that creates an odor cap; a facultative layer that converts nutrients and liquefies organic solids, and an anaerobic layer at the bottom that further digests solids and where phosphorus settles.

Does it work? The Wagners surely think so. Dave Avila, an environmental engineer at Oakdale, Calif., tells me it does. And Campion has testimonials extolling the virtues of his system.

My advice is that dairy folks make their own decision to fit their conditions. Check www.ProActMicrobial.com for info. One farmer wondered how bacteria can eat up manure in a lagoon. I don't know, but I do know that our stomachs - with no mechanical equipment - have microbes that change food to waste. And that seems to work pretty well.

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