



Western Dairy News

for the West, about the West, from the West

Got Manure? Need a Technology?

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MANURE is a fact of life for those who produce milk. The more milk your cows produce, the more manure you'll have to manage because cows aren't perfect converters of feed.

In the area of manure technology there is always someone selling additives or treatment technology to help manage your manure problem. If you don't know exactly what your manure problem is, any technology has the potential to solve it. Only after you define your problem (physically or chemically) can you identify the appropriate treatment. To define your manure problem, ask yourself the following questions:

- Are you cow rich and land poor?
- Do you have sufficient acres to manage your manure to the specifications of your local and state water regulatory agencies?
- Is salt accumulating in the soil?
- Is nitrate or salt degradation of groundwater or nutrient enrichment of surface waters a local concern?
- Do your neighbors (or others) complain about your manure application activities?
- Are gaseous emissions from your facility a concern to citizens and/or a regulatory authority?
- Are people who cite manure as a reason to not have dairies in your backyard?

If you answer yes to any of these questions, then you are a potential candidate for a "manure technology." Before hunting for a treatment technology, don't overlook the potential impact of diet modification.

Where do you go to find the appropriate manure technology?

In the ideal situation there would be a central information clearinghouse for manure treatment technology. The information would be from controlled research trials and would help determine the effectiveness of a particular technology for your problem.

Let's say you generate more phosphorus (P) than you are able to manage on your land. You are looking at a separator to separate solids from liquids. To decide if this separator will help with your P problem, ancillary information is necessary. It is important to know that most P in liquid dairy manure is in very fine particles and is not easily separated without additional input (chemicals to cause flocculation), and solids from traditional inclined screens do not account for very much of the P in the system. With this ancillary information you can determine that this separator isn't going to help with your P imbalance.

Presently, there are two useful sources of information on manure technology and another in development. North Carolina State University tested 18 technologies. Their two-year report can be found at:

http://www.cals.ncsu.edu/waste_mgmt/2yrreport.pdf.

It defines Environmentally Superior Technology (EST) as any technology, or combination of technologies that (1) is permissible by the appropriate governmental authority; (2) is determined to be technically, operationally, and economically feasible for an identified category or categories of farms; and (3) meets the following performance standards:

1. Eliminate the discharge of animal waste to surface waters and groundwater through direct discharge, seepage, or runoff.
2. Substantially eliminate atmospheric emissions of ammonia.
3. Substantially eliminate the emission of odor that is detectable beyond the boundaries of the parcel or tract of land on which the farm is located.
4. Substantially eliminate the release of disease-transmitting vectors and airborne pathogens.
5. Substantially eliminate nutrient and heavy metal contamination of soil and groundwater.

The second source is a Canadian effort to make manure technology effectiveness easier for the layperson to understand. The Environmental Technology Verification (ETV) program was founded in 1997 by Environment Canada and Industry Canada. The Ontario Centre operates the program for Environmental Technology Advancement.

The certification process gives recognition by the Government of Canada that claimed performance of the technology has been assessed and confirmed using a rigorous procedure to validate the truth of the performance statement. There is a Manure Management Technology Performance Verification component to this program. A list of program graduates is on their website:

http://www.etvcanada.com/English/e_progGrad.htm.

The advantage of this program is that individuals have a place to check and see if a technology actually meets its sales claims. The disadvantage is, parameters other than those identified in the claims

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are not discussed. For example, if a technology has a claim to reduce methane, but this is accomplished along with a huge increase in ammonia emissions, the technology still graduates from the program. The large ammonia emissions information is not necessarily available to the consumer.

The California Air Resources Board has recently convened a Dairy Manure Technology Feasibility Assessment Panel whose purpose is to review technologies likely to

improve management and treatment of dairy manure in the San Joaquin Valley. Its goal is to produce a report that lists and describes these technologies; assesses the environmental and economic performance of each; and makes recommendations about which types of technologies may hold the most promise for improving dairy manure management and treatment in the San Joaquin Valley. Panel members include representatives from federal, state and local

government, industry, environmentalists, conservationists, and academia. The Panel is not funding research to validate claims or analyze technologies but will simply evaluate available data. Findings should be available in summer 2005 through the California Air Resources Control Board. Contact the local distributors you know and encourage them to provide information to the group for evaluation. This can be done electronically at: <http://www.manureproducts.info>.

Viral Teat Disease in Dairy Cattle

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OFTEN with cold, wet weather comes a rash of teat end lesions. Some of these are noninfectious and related to the irritation and chapping of teats due to wet, muddy conditions. Many times these lesions become secondarily infected with opportunistic bacteria. Other lesions are caused by viral infectious agents that are aided by the small wounds of irritation and chapping. The focus of this article will be on these viral lesions.

Bovine herpes mammillitis, as the name suggests, is a herpes virus. It is related to, but distinct from, infectious bovine rhinotracheitis, IBR, and the human herpes simplex or cold sores. Cows are thought to be the source of this virus and latent infection may occur.

The onset of this disease is usually sudden with appearance of scabs, ulcers, or pox-like lesions on the udder and teats. Very careful observers may see areas of edema on teats with vesicles or blisters. However, the blisters quickly rupture due to contact with bedding and milking machines. Once blisters rupture, serum may ooze from the lesions and a scab quickly forms. These lesions are painful when handled, and cows will often kick at the milking machine and milkers.

As with other lesions on or near the teat end, mastitis commonly follows the appearance of the viral lesion. This disease is self-limiting in most cows so that the lesions heal without scarring in several weeks. In some cases, the lesions may cover a large portion of the teat, resulting in a long recovery period and perhaps culling. Occasionally the lesions may spread to the udder and surrounding areas and may end with large skin sloughs.

While there is an immune response to the disease (causing antibodies to be formed), there is little if any systemic reaction. The open lesions may serve as a source of virus to infect other cows for about 10 days. While the virus can surely pass from cow to cow during milking, cases have been seen in heifers prior to their first calving, suggesting other routes of transmission. It has been suggested that biting insects may be involved. Most cows

develop immunity to the disease that protects them from further infections for perhaps a few years.

Pseudo cowpox is another viral disease resulting in teat lesions. It closely resembles the **papular stomatitis** virus of cattle. The viral agent is somewhat related to the smallpox virus. It is also the cause of milkers' nodules. This particular virus is very resistant to heat and drying and is capable of remaining infective in scabs and tissue fragments.

The virus causes a variety of ulcerative lesions covered by scabs on teats without systemic signs of disease. In herds with excellent milking hygiene, the infections are usually discrete pox-like lesions, very mild, and cause no major problems. In other cases complicated by wet, cold weather and poor milking hygiene, large scabs may form followed by mastitis. When scabs are removed by milkers or during milking, an ulcer may be found beneath them.

Early on there is pain, edema, and reddening to the infected area. This is followed by a blister and quickly by a pustule and scab. In about 10 days, the center of the scab usually falls off, leaving a characteristic ring or partial ring of the remaining edge of the scab.

Cattle are probably the source reservoir of the virus. Transfer from cow to cow is often on milking machines or milkers' hands. Infection is greatly aided by abrasions or wounds such as irritation from overused inflations or chapping. Immunity is short lived, and re-infection may occur within several months after the lesions

heal. Pseudo cowpox may cause infections on the hands of milkers as their hands are often chapped or cracked, providing an easy point of entry. Relief milkers may also transfer the virus from one dairy to another if they have lesions on their hands.

Control to minimize the negative effects of an outbreak should be focused on prevention of spread from animal to animal, with particular attention to milking hygiene. Milkers should wash their hand between cows. This cleaning can be facilitated by wearing gloves during milking. Towels should be used on one cow only and then be discarded. Teats should be thoroughly cleaned and dried before milking units are attached.

Most teat dips used to control mastitis are effective against the viral agents and should be applied to cover the entire teat. When chapping is present, teats dips with emollients or glycerin may be used. While ointments, lotions, and salves may be helpful in treating lesions, great care should be taken not to spread the virus by repeated hand entry into the ointment containers.

As with other infectious diseases, infected cows should be milked last. Milking equipment should be evaluated to ensure it is functioning properly. Liners should be changed more often than under normal conditions.

In most mammillitis or pseudo cow pox cases, no attempts are made to get a definitive diagnosis. It is, however, possible to do so by testing blood samples for antibody titers, attempting to recover virus from the scabs, or submitting teat skin biopsy samples for examination at the veterinary diagnostic laboratory.

When lesions appear on the teats of cows there should also be consideration given to two other viral diseases of cattle: **vesicular stomatitis** and **foot and mouth disease**. Both of these diseases cause formation of blisters on teats in addition to blisters on lips, in the mouth and nose, and between the claws. Lesions at other places besides the teats will probably be the major signs of these two diseases.

Smacking of the lips and excessive drooling are usually initial signs of these diseases. It is not possible to tell them apart based on clinical signs of the disease. The combination of blisters on the mouth, nose, feet, and teats should immediately alert the dairy producer to contact the herd veterinarian or state veterinary officials.

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