

Consider waste management when selecting a bedding system

Jesse Ray for *Progressive Dairyman*

Every dairy farm, no matter the size, has to manage its production site waste. Production site waste, for the purpose of this article, is any material or its byproduct that requires routine management or handling and can be land-applied.

Dairy manure and parlor water are both easily identifiable sources. Animal bedding, misters, soakers and waterers all add to the mix. Also, leachate and gray water can contribute a large volume to your production site waste.

Types of waste management vary

Common alley cleaning methods include a rubber tire scraper on a skid steer, cable-driven alley scrapers and flush lanes using recycled wash or lagoon water. Some barns are built

“ If you are a dairy farmer, you know how you currently handle your production site waste. However, when considering a renovation or change, particularly in cow bedding, your waste management plan can be much more costly and complicated than meets the eye. ”

right on top of a waste storage tank where cows stand on slatted floors and waste material drops through the slatted floor and into storage. Cleaning a freestall barn with slatted floors can be as simple as walking down the alleys with a hand-held scraper.

Cleaning barns using any of these methods only gets the material to one end of the barn (or under it); from there where does it go? Some directly load into a spreader and haul to the fields. If this is you, I am betting you use a skid steer and

scraper or bucket. Alley flushers likely go out the end of the barn and directly to long-term storage or into a reception structure, then directly to long-term storage.

Those reception structures mentioned can be quite diverse as well. Flush-flume systems, reception tank pump systems and cross-channel shuttle systems are just a few of the options. Each can work in some combination with barn cleaning methods mentioned, but not all.

Much of what dictates the design of the reception structure comes from what a farmer wants to do with the production site waste after it leaves the barn. Much of what dictates that is the cow bedding.

Before we get too far ahead and jump right into bedding, let's discuss that parlor water, leachate and gray water mentioned earlier.

Leachate and gray water from feed storage areas are likely not a “real” management issue unless you are required to manage them. For example, if a farm is regulated by a discharge permit, likely it will have to collect and store its leachate and perhaps treat its gray water. If not, it can be stored and then spread on fields.

Parlor washwater tends to be fairly dilute and is often treated in grassed infiltration areas adjacent to the farm. Other farms collect and pump the water to long-term storage or transfer directly to a spreader and then to fields.

Switching your bedding may be more than meets the eye

If you are a dairy farmer, you know how you currently handle your production site waste. However, when considering a renovation or change, particularly in cow bedding, your waste management plan can be much more costly and complicated than meets the eye.

Here is a design-planning process that I recently completed. It might sound familiar to a dairy looking to expand their herd.

The farm with a 400-cow freestall barn was hoping to add 400 additional stalls and switch to sand bedding from rice hulls on top of traditional mattresses.

They had visited three or four other dairy farms of comparable size using sand, discussed management concerns, operational cost and milk production with each operator.

After the visits, the dairy producer wanted to see what it would take to switch the farm to sand bedding. Of course, the key is the cost of both the renovation and operations after the switch, so my job began.

The change-over in the existing barns meant 400 stalls with concrete bases (4 feet x 8 feet x 8 inches thick each) had to be chiseled out and rebuilt to accommodate deep-bedded sand. The new 400-stall barn is fairly simple and designed with sand in mind.

Things we considered:

Sometimes the signs just aren't this obvious.

DANGER MYCOTOXINS

If your cows show any of the following symptoms, mycotoxins may be the reason for decreased performance:

- Sporadic loose manure
- Reduced dry matter intakes
- Reduced milk production
- Increased somatic cell counts
- Excessive DAs or metabolic disorders
- Decreased reproductive performance
- Unthrifty appearance
- Erratic intakes
- Short cycled heats
- Cystic ovaries or abortions

Select BioCycle Plus and Select DTX are specially formulated to assist the cow when challenged by mycotoxins. Talk with your Select Sires representative to learn more about these products.

SELECT SIRES YOUR SUCCESS *Our Passion.*
Telephone: (614) 873-4683 • www.selectsires.com

™Select BioCycle Plus and Select DTX are trademarks of Select Sires Inc. and are manufactured by Agrarian Marketing Corporation. All claims, representations and warranties, expressed or implied, are made only by Agrarian Marketing Corporation and not by Select Sires Inc.

UDDER STANDING MARGIN

MULTIMIN 90 SUPPORTS DAIRY PRODUCTION

MULTIMIN® 90 pre-treatment supports an existing well-designed oral feed program to contribute to udder and reproductive health.

www.multiminUSA.com
1.866.269.6467 | 1.970.372.2302

Rx REQUIRED

Videos at YouTube "Multimin USA" Channel

Protected by U.S. Patent #7,285,292. Copyright © 2012. All Rights Reserved. AT201302-03



Photo by Walt Cooley.

1 *Where is the nearest sand source?* If we find that the nearest sand source suitable for bedding is far away, then we must consider sand separation for reuse. That adds to the operation and management cost. If there is a sand source nearby, and sand quality and price are reasonable, the producer must account for the operating cost of purchasing sand on an ongoing basis.

2 *If we decide to separate sand, what kind of system should we choose?* A gravity sand lane sand separation system was a common

theme among the farm visits, for this example. We became comfortable with the management requirements, so we moved forward in that direction.

3 *What is the cost of operation when the cows are on sand?* During the analysis for the farm, we further analyze the cost of operations when cows are on sand. In this example, we find that additional staff or longer hours are required to manage the sand lane and that emptying the long-term manure storage basin will now require vehicle access as some sand

will make its way in and need to be removed. Access means additional concrete in the storage basin. This also means a change in how the custom haulers empty the basin and the cost to do so. At this point in the analysis, the prospect of good milk production of the cows on sand is paying for the expansion and operating costs.

4 *What will be the impact of choosing a flush-flume system?* The existing 400-cow barn on hulls and mattresses used alley scrapers to pull the waste to the low end of the barn into a cross-channel and gravity

flowed to long-term storage. With a proposed change to sand bedding, however, using a gravity sand lane to separate sand requires a flush-flume system. Wastewater from storage will be pumped at high volume through a pipe under the barn floor. The flush pipe now will replace the cross-channel – another retrofit. Also, the new barn, designed 100 feet to the west of the existing barn, will require additional fill dirt because the flush pipe needs to slope from one end to the other in order for the flush water to flow as designed – an

Continued on page 75

Spiro-Mix TMR & Trailer Mixers

- Gentle tumbling action - easy on feed
- Spiro reel and auger provide TRUE end-to-end mixing
- Stainless steel in critical areas
- Optional hay knives to process hay and straw
- Trailer Mixers




- Hydro Cart, HONDA Powered Feed Carts
- Stainless steel feed box
- Heavy-duty drive

Conveyors - 11, 18, 24 & 30" widths





E. Rissler Mfg. LLC
 2794 Brumbaugh Road • New Enterprise, PA 16664
814-766-2246

Broadcaster Remote Engine Controller

Designed for Tanker & Drag-hose systems



- ✓ Retrofittable on mechanical or electronic engines, & 3-phase VFD-driven motors
- ✓ Reliable with built-in safety features
- ✓ Improve pump efficiency
- ✓ New Boost Pump Cruise Control

Sunova WORX (519) 349 2770 www.sunovaworx.com
 With over 16 years in the Ag industry, we understand the value of high-quality service & equipment

PROFESSIONAL
DAIRY MILK

THE ONLY SURPRISE
YOU GET WITH
DAKOTA GOLD IS
THAT THERE ARE NO
SURPRISES.

Dakota Gold set the standard in DDGS with the highest quality, most consistent product on the market. Designed to maximize utilization and performance, Dakota Gold DDGS are in a class of their own, giving you the reliable and cost-effective solution you need. Dakota Gold also provides excellent pelleting and flowability, making it easy to transport and work with. When only the best DDGS are good enough, only Dakota Gold will do. DakotaGold.com

POET



DakotaGold

Quality
Distilled

Consider waste management when selecting a bedding system, cont'd from page 73

added construction cost. The flume pipe discharges into a concrete sand lane. From there the waste would ideally gravity flow into long-term storage. We also want as much clean water as possible, so we plumb the parlor washwater into the flush pipe to help clean the sand – another retrofit. In this example, the existing manure storage basin top has an elevation that is above the low point of the sand lane. Now we have to pump the manure back into storage – another added cost.

5 *What regulations must be considered?* As the design progresses, we find that our soil investigations show the sand lane would be closer to bedrock than the regulated separation distance. State regulations (DNR, NRCS and county land conservation departments) require, among many guidances, a separation distance to bedrock from waste-handling structures; the code does allow bedrock removal, but the overall cost of rock removal has put the expansion over its preliminary budget.

As you can see, changing to sand in this instance may not be as simple as swapping out the mattresses and digging up concrete. There are many variables, all interconnected, that may affect the transition, including the existing farm layout and the location and geology of the farm – both are things that the producer can't control – that have made a switch to sand impractical for this particular farm.

Any one of the following may make a cost-benefit analysis turn upside-down for the expansion or renovation.

- ◆ Distance, price and availability of bedding
- ◆ Cost of managing bedding and

waste on a day-to-day basis in terms of labor and manure hauling

- ◆ Cost and need to change existing systems or added costs to new proposed systems (vehicular access to lagoon, additional concrete lanes, plumbing changes in parlor, etc.)
- ◆ Cost and need for separation system
- ◆ Change or no change to alley cleaning and manure transfer plan
- ◆ Change or no change to manure storage plan

◆ Environmental regulations in your area

In the example provided above, after several weeks of design planning and money spent, the producer decided that it is important to evaluate and compare the construction and management cost of other bedding types and associated systems.

The next step will be to go and visit farms that are using deep-bedded manure solids, newer mattresses and waterbeds to compare the cow comfort. Once the

producer decides on another bedding choice, we will begin the planning process again, running a similar cost analysis based on known production levels on these bedding types and compare the cost of construction and operations. **PD**

Ray is an owner and manager of Outland Design, LLC, a Wisconsin-based, full-service, certified and professionally insured civil and agricultural engineering, design and consulting firm. He has been a part of more than 250 dairy design projects.

Accelerated Genetics®



L-R: GenerVations MOM Lola, Gen-I-Beq Manoman Bibi, Mapel Wood Manoman Bambi, Misty Springs MOM Santana, Mapel Wood Man O Man Bombi, Morsan Manoman Fools Gold-Red, Mapel Wood Man O Man Lucy Photo by: Patty Jones

TO BE THE PRODUCER'S TRUSTED FIRST CHOICE.

Accelerated Genetics is your source for quality genetics and professional services. From time management and reproduction programs, to reliable and safe storage options and the highest quality professional people – Accelerated Genetics has it all.

**CALL US TODAY TO FIND OUT HOW
WE CAN MEET YOUR GOALS.**

800-451-9275 | INFO@ACCELGEN.COM | WWW.ACCELGEN.COM



Jesse Ray

Owner and Manager
Outland Design, LLC

jray@outlanddesignllc.com

www.progressivedairy.com