



Compost as Bedding

Bedding for dairy cattle is rapidly becoming one of the most expensive inputs in the dairy industry. In current economic times, it is getting harder for dairy producers to find consistent, quality bedding for their cattle. A lack of adequate, quality bedding often contributes to foot, health, and performance problems observed in dairy cattle herds. Many dairies are considering using composted dairy manure solids (DMS) as the source of bedding for their cattle; however, there are several possible health concerns for both the cattle and milk produced by cattle on composted DMS.

Various Compost Systems

When producing DMS for bedding or any other alternative use, there are several different methods available. Many farms opt to separate their solid waste before composting or other processing, but most reuse the DMS as a fertilizer or re-sell it as a value added product. Composting is not required for producing separated solids.

When using compost as bedding, a composting pack barn can efficiently process the waste in-house or the waste can be removed for processing and composting. A composting pack barn case study was performed with Eagleview Dairy in New York by Cornell University. The concept of the compost-bedded barn was to perform “sheet” composting inside the pack barn. The barn was bedded with a base layer of clay to prevent leaching nutrients and waste, followed by 24” of carbon source such as sawdust; the animals add the nitrogen needed for composting in their feces and urine. The pack was turned as often as twice per day to mix the carbon and nitrogen and to regulate the composting temperature for cow comfort. More carbon material was added as needed. The use of a compost pack barn eliminated odors and the need of waste storage and disposal, produced rich organic compost for re-sale, and provided the superior comfort compared to concrete bedded stalls. (Petazen, 2009)

When composting is done after removing the animal waste, separating the solids speeds the composting process and reduces the cost of co-composting products. Mechanical methods of separation are some of the more costly options, but are efficient. Such mechanical methods involve inclined or vibrating screens, belt or screw presses. Belt presses yield the largest amount of dry material of all systems.



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Non-mechanical options include septic or settling tanks with means of removing the liquid top layer. When separation is not an option, dairy waste can be composted with large amounts of dry carbon source to counteract the amount of nitrogen and moisture in the feces.

Health Concerns of Compost Bedding

There are several health concerns related to the use of DMS compost as bedding; foremost is the concern of herd health, particularly as it relates to somatic cell count (SCC), mastitis, lameness, and overall performance. In a study performed by Cornell University, a comparison of composted DMS to sand bedding resulted in very similar numbers for SCC and mastitis incidence for both bedding materials (Harrison, Bonhotal, & Schwarz, 2008). Several studies, including the one from Cornell, indicated that the animals bedded on DMS had lower occurrences of lameness compared to any other bedding. No study found the overall performance substantially increased or decreased in the short run when comparing different bedding types; however, the increased cow comfort indicated by the lower frequency of lameness may positively affect the longevity of cow performance in the long run. No studies have indicated or disproved that possibility.

It is interesting to note that when comparing bacterial content of the composted DMS to other bedding materials, newly composted bedding has a lower bacterial count than most other bedding choices while used composted bedding bacterial count is equal to or higher than other bedding (Bishop, Janzen, Bodine, Caldwell, & Johnson, 1981).

Secondly, the effect of using compost bedding on the final milk product must be considered. By observing a lack of increase in mastitis incidence of cows bedded on composted DMS, we can deduce that bacterial populations in the DMS bedding are not negatively affecting the quality of milk. However, bacterial swabs of the teat ends on cows bedded on DMS show a higher count of gram positive and negative bacteria. (Bishop, Janzen, Bodine, Caldwell, & Johnson, 1981) Despite that fact, it has been found that there is no correlation between the higher bacterial count and

low milk quality or mastitis incidence. (Harrison, Bonhotal, & Schwarz, 2008) In addition lime can be spread under the DMS solids to reduce the bacterial count while the bedding is in use. (Kryzanowski, 2009) More research is being conducted on the subject.

Advantages of Compost Bedding

Composted DMS bedding provides several production and environmental benefits without compromising herd health.

- Composted bedding provides a source of utilization for waste that can cut down bedding costs by 1 to 26 cents per hundred weight of milk. (Harrison, Bonhotal, & Schwarz, Using Manure Solids as Bedding, 2008)
- Composting systems can build off of current structures and waste utilization procedures.
- Composted DMS provides superior comfort to cows, reducing lameness and potentially increasing production.
- Excess DMS can be spread on crops in compliance with the production waste utilization program.

Disadvantages of Compost Bedding

Depending on individual circumstances, some of these disadvantages may apply:

- Facilities or machinery required have a high initial cost.
- Some composting systems may produce undesirable odors if not properly managed.
- Used composted DMS bedding can have equal to or more bacteria than other bedding.

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