

Manure solids for bedding: an alternative worth considering?

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Animal comfort in the barn is very much in vogue these days. Valacta has even given the subject top billing in the training sessions that will be offered throughout Quebec during the winter of 2015 (see Box 2).

A comfortable cow is a cow that can go about her business with no worries. And how does a comfortable cow spend most of her time? Resting, of course, which explains why the surface provided for cows to lie down on is such an important aspect of cow comfort.

Depending on barn type, budget, bedding availability, removal and numerous other factors, the choice of bedding is not always an easy one. For the cow, the crucial point is to provide a clean, dry, comfortable surface that is soft, stable and slip-resistant.

Non-traditional manure-based options for bedding

In both the United States and Ontario, more and more farms are doing things differently: they are using recycled or composted manure as bedding (Table 1).

Recycled manure solids as bedding

The solids separated in this process have a moisture content between 65 and 68 per cent. If the manure has not been digested, it is recommended that the solids be composted to destroy any pathogens that may cause mastitis. The manure solids can be composted in piles (at least seven days) or using a composter

(24 hours). The resulting substrate can be then be spread in the freestalls. If the material is too dry, the ventilation will blow up a dust storm in the barn; if it is too moist, it may start to heat up.

Composted bedding

Composted bedding is based on the same principle as deep-bedded packs, except that the compost-manure mixture needs to be aerated daily to add oxygen and continue the composting process. It is important to ensure that the temperature reaches between 55 and 65 °C in order to neutralize any pathogens in the bedding. Twice-daily tilling of the compost is recommended.

The material that is generally recommended, in particular because of its particle size (see photo), is sawdust. Other materials can also be used, but the chop length often makes it difficult to obtain a good carbon-nitrogen ratio. To build the composted pack base, a 30-40 cm layer of bedding material is initially spread over the floor. Fresh bedding is then added on a weekly basis. Twice a year, the compost is removed from the barn and can be spread in the fields. Each cow must have a resting area of 120 sq. ft. The larger the resting area, the less significant the microbial population. Adequate

ventilation is also required to eliminate moisture and heat produced by the cows and the composted bedding.

Composted bedding is generally used in loose-housing facilities. In tie-stall barns, there is some worry that bacterial growth will escalate due to the heat generated by cows that are permanently in their stalls, in addition to reduced air circulation at floor level. Not to mention the complexity of adding and removing bedding in this type of facility.

Is it cost-effective?

One of the aims of using these different techniques is, of course, to reduce bedding costs. Straw currently costs about \$250 per tonne, which amounts to about \$11,000 - \$15,000 per year for a herd of 60 cows that use an average of two kilograms per day. Some farms may be able to cut these variable costs, but it is important to evaluate the initial investment that is required (substantial for the purchase of a digester or separator) before getting involved.

So, is it an alternative worth considering?

When it comes to choosing bedding, animal comfort and well-being must take priority. The bedding must also be eco-

nomical and easy to spread. Composted or recycled manure solids have the potential to meet all of these criteria, provided the technique is properly managed. At any rate, from the looks of this cow deep in slumber on a composted manure pack (see photo), the option seems to be worth contemplating.

Does the presence of bacteria from manure increase the risk of mastitis?

The question is indeed an important one, since we are talking about organic matter, and what's more, fecal matter. In short, an environment that already contains bacteria and is conducive to bacterial growth. None too reassuring when the objective is to maintain good udder health in the herd. An American study found that the number of cows with a somatic cell count over 200,000 SC/ml was similar between farms using recycled manure solids and those using sand as bedding. Furthermore, the quantity of bacteria present in the unused bedding was not necessarily correlated to high SCC levels or the incidence of mastitis. Milking technique is therefore a key factor in preventing pathogens from entering the mammary gland.



BOX 2

The barn: a source of comfort

Doing things differently doesn't always have to involve major changes like those mentioned in this article. Sometimes small, simple, low-cost adjustments are enough to reap substantial rewards. That is precisely what we will be discussing with you at the Valacta training session offered this winter, all over Quebec.

Join us to explore some practical and cost-effective ways to improve cow comfort in your barn.

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TABLE 1: NON-CONVENTIONAL BEDDING USING MANURE

TYPE	PROCESS	ADVANTAGES	DISADVANTAGES
1- recycled manure solids	Separated solids: composted in windrows, piles or with a composter	<ul style="list-style-type: none"> • Little or no new bedding required 	<ul style="list-style-type: none"> • Significant microbial load • Higher moisture level • High cost of separator • Dark colour
	Digested solids: dried or in piles	<ul style="list-style-type: none"> • Energy recovery • Microbial load is lower than in separated manure 	<ul style="list-style-type: none"> • High cost of digester or separator • Significant microbial load • Dark colour
2- composted bedding	Aerated: material is tilled directly in the bedded pack resting area	<ul style="list-style-type: none"> • Requires less bedding than deep-bedded packs • Cost of equipment lower than for recycled manure 	<ul style="list-style-type: none"> • Choice of bedding material is limited by particle size • Time required for tilling • Dark colour • Not easy to reach a temperature of 55-65 °C