



**Cost and labor efficiency as well as cow comfort are of utmost importance in bedding selection.**

### Introduction

Some type of bedding is needed in almost every dairying operation. The best bedding choice will depend on the type of housing used, as well as local cost and availability of different bedding products. The best bedding material for combating lameness may not be best for udder cleanliness. Relative concerns regarding such different problem areas will also influence bedding material recommendations.

### Desirable Characteristics of Bedding

There are two driving factors behind good bedding choices. One is cow comfort, and the other is farmer comfort. The two have some common areas and some diverging areas. Cow comfort is critical because of the importance to both cow and farmer of the cow spending most of the day lying down processing feed into milk. Therefore bedding must be comfortable to lie on. Because cows are large animals, bedding must offer uniform support. Coolness in summer and warmth in winter will promote cow comfort. Dry bedding is critical at all times both for comfort and for reduction in pathogen growth. Good footing is important for injury prevention. Nonabrasive bedding promotes both comfort and injury reduction. Farmer comfort requires in addition that bedding be cost efficient, labor efficient, and that the bedding drain well to keep cows dry and limit growth of pathogens.

### Barn Design Affects Bedding Options

There are several formats in dairy barn alignment. There are open style barns in which cows are free to move around at will and lie down wherever they choose. These barns have separate feeding and watering areas, typically on concrete. There are also barns with individual stalls. These may be tie stalls in which an individual cow is restrained within a stall, or they may be free stalls in which cows are allowed to move about the barn, but the barn is subdivided into individual stalls in which a cow may stand or lie down. In tie stall barns, feed and water are provided to individuals, while in free stall barns, cows move to feed and water stations. Pros and cons of different beddings will depend on barn design.

### Specific Bedding Choices (in alphabetical order)

**Compost**, or actually composting material, is used as bedding in open style barns. Approximately 12-18 inches of a material such as wood shavings or sawdust is initially spread in the barn. Manure builds up gradually. The barn must be aerated to a depth of 8-12 inches twice daily during milking. Shavings or sawdust are added weekly as needed. The pack can rise to as much as 4 ft, and is removed once or twice a year to be spread on fields. This system requires very good ventilation (tall hoop structures predominate), as well as excellent teat cleaning at milking. Feed and water are maintained in separate alleys, generally on a concrete floor. This system has been found very comfortable to cows, and foot and leg health are reported as positives of using this bedding system. Up to 100 ft sq per cow is recommended.

**Barn design influences bedding alternatives**

- Tie stall
- Free stall
- Open style

**Geotextile Mattresses** manufactured from a variety of materials are commercially available. These may be used in either tie stall or free stall barns. These have waterproof exteriors, and are filled with a variety of materials including rubber crumbs, polyethylene foam, and water. They are marketed as requiring no bedding, but research has shown (see Bernard, et al. and Tucker and Weary) that added bedding makes the mattresses much more attractive to cows. Mattresses are generally installed in rows, attached to one another, and come in a variety of sizes to fit typical stall sizes.

**Paper** may be available inexpensively in the vicinity of paper mills. Chopped recycled newsprint has also been used for dairy bedding. Both can be effectively mixed with other bedding materials. Fineness of chop will influence bedding characteristics.

**Sand** can be a good choice of bedding. Depth of 6-8 inches in a tie stall or free stall barn is recommended. Because sand is an inert material, it will not tend to promote growth of pathogens, though when mixed with manure, the manure will support pathogen growth. Particle size is of great importance. Too small a particle size (or too much organic matter mixed in) will hold water too well. Large particles (> 3mm) will not be comfortable to lie on. Sand which is naturally occurring will have more rounded edges and be more comfortable as bedding than manufactured sand which comes from crushing rock. Refer to the Gooch and Inglis paper cited below for more information on the importance of particle size and sand quality. The potentially negative side of using sand as bedding comes in the disposal. In a liquid manure handling facility, sand must be settled out and disposed of. If this could be done in such a way as to reuse the cleaned sand, however, it would become a benefit.

**Sawdust and Wood shavings** are probably the most commonly used bedding products for dairy cows. They have the advantage over sand of being broken down by microorganisms in the disposal system, but they have the disadvantage of allowing growth of microorganisms (pathogens). Addition of lime to bedding may reduce growth of pathogens. The smaller particle size of sawdust makes it more absorbent than wood shavings and quicker to break down. However, small particle size is also associated with rapid growth of bacteria and other harmful pathogens. Cost and availability tend to be deciding factors in choice of material.

**Straw** composts well and reduces in volume when composted, better than sawdust or wood shavings. It is important when using straw as bedding that the particle size be small, preferably fitting through a ¾ inch screen,

both to increase animal comfort and to shorten breakdown time. Bedding absorbency as well as comfort to animals varies according to the species as well as to the chop size. Straw is an attractive bedding alternative when it is produced on the farm.

## Resources

Bernard, J.K., J.W. West and G.H. Cross. Preference of Lactating Dairy Cows for Four Commercial Freestall Mattresses. The Univ. of Georgia, CAES, Dept. of Animal and Dairy Sci., 2001/2002 Annual Report.

[http://www.cpes.peachnet.edu/ads/ADS%20Reports/2001-2002%20REPORTS/ADSReport2001\\_29.pdf](http://www.cpes.peachnet.edu/ads/ADS%20Reports/2001-2002%20REPORTS/ADSReport2001_29.pdf)

Endres, M.I. and K.A. Janni. Compost Bedded Pack Barns for Dairy Cows. University of Minnesota, St. Paul.

<http://www.extension.umn.edu/Dairy/Publications/CompostBarnSummaryArticle.pdf>

Gooch, C.A. and S.F. Inglis. "Sand for Bedding Dairy Cow Stalls." Biological and Environmental Engineering Department, Cornell University.

<http://www.uwex.edu/ces/dairymod/cowcomfort/documents/SandforBeddingDairyCowStalls-Gooch.pdf>

New York State Cattle Health Assurance Program. "Mastitis Module Fact Sheet."

Bedding Materials and Udder Health

<http://nyschap.vet.cornell.edu/module/mastitis/section1/BeddingMaterialsUdderHealth.pdf>

Selders, A.W., G.H. Carpenter and R.A. Childs. "Recycled Newspaper for Animal Bedding." West Virginia University Extension Service.

<http://www.wvu.edu/~agexten/pubnwsltr/TRIM/10854.pdf>

Tucker, C.B., D.M. Weary, M.A.G. von Keyserlingk, and K.A. Beauchemin. 2009. Cow comfort in tie-stalls: Increased depth of shavings or straw bedding increases lying time. J. Dairy Sci. 2009. 92:2684-2690.

<http://jds.fass.org/cgi/content/full/92/6/2684>

Tucker, C.B. and D.M. Weary. 2004. Bedding on Geotextile Mattresses: How Much is Needed to Improve Cow Comfort? J. Dairy Sci. 87:2889-2895.

For more information visit [www.umass.edu/cdl](http://www.umass.edu/cdl)

Factsheets in this series were prepared by, Masoud Hashemi, Stephen Herbert, Carrie Chickering-Sears, Sarah Weis, Carlos Gradil, Steve Purdy, Mark Huyler, and Randy Prostack, in collaboration with Jacqui Carlevale.

This publication has been funded in part by the Massachusetts Department of Agricultural Resources and the Massachusetts Farm Bureau Federation, Inc.