

## Effect of Bedding Material on Production, Reproduction, Health and Behaviour of Dairy Animals

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### INTRODUCTION

In modern dairy farming, the emphasis has shifted from only increasing milk yield to improving animal comfort and welfare. Dairy animals spend a major part of their day lying, resting, ruminating, and standing on housing floors. Therefore, the quality of bedding has a direct impact on their physical comfort and performance.

Poor bedding can lead to injuries, lameness, mastitis, reproductive problems, and behavioural stress. On the other hand, well-managed bedding improves lying time, rumination, hoof health, and milk production. Selecting suitable bedding material according to local climate, availability, and farm management is essential for sustainable dairy farming.

#### Types of Bedding Materials

Bedding materials used in dairy housing can be broadly classified into **organic** and **inorganic** materials.

#### Organic Bedding Materials

These include straw, hay, sawdust, wood shavings, crop residues, composted manure, and recycled manure solids.

#### Advantages

- Soft and comfortable for animals
- Absorb moisture effectively
- Easily available and relatively inexpensive
- Compatible with manure handling systems

#### Limitations

- Support bacterial growth when wet
- Higher risk of mastitis if not managed properly
- Require frequent replacement
- Can produce foul odour

### Inorganic Bedding Materials

Common inorganic materials are sand, rubber mats, limestone, gypsum, and concrete floors.

#### Advantages

- Do not support bacterial growth
- Durable and long-lasting
- Lower risk of mastitis (especially sand)

#### Limitations

- Often costly or difficult to procure
- Sand may interfere with manure handling systems
- Hard surfaces like concrete reduce animal comfort

### Important Characteristics of Good Bedding Comfort

The primary purpose of bedding is to provide comfort. Soft, dry, and even bedding encourages animals to lie down for longer periods, improving milk yield and welfare.

#### Particle Size

- Sand: 0.1–1 mm is ideal
- Wood shavings: medium-sized particles are preferred, very fine particles may stick to teats and skin, increasing infection risk, while large particles may cause discomfort or injury.

#### Moisture Control

Dry bedding is essential. Wet bedding promotes bacterial growth and increases mastitis risk. Proper ventilation and sunlight help maintain bedding dryness. Ideally, bedding moisture should remain between **40–60%** in compost systems.

#### Availability and Cost

Bedding should be locally available and economical. Frequent replacement must be feasible without increasing production costs excessively.

### Effect of Bedding Material on Health and Performance

#### Udder Health and Mastitis

Organic bedding materials generally harbour more bacteria than inorganic ones. Sand bedding is considered superior for udder health as it does not retain moisture or support bacterial growth. Animals housed on concrete floors show a higher incidence of teat injuries and mastitis.

#### Hoof Health and Lameness

Hard surfaces like concrete increase hoof wear, heel erosion, and lameness. Soft bedding materials such as sand, straw, and rubber mats significantly reduce hoof lesions and improve locomotion. Lameness leads to reduced milk yield, fertility problems, and early culling.

### Milk Production

Animals provided with comfortable bedding show increased lying and rumination time, which positively influences milk production. Studies have consistently reported higher milk yield in sand and compost-bedded systems compared to concrete floors.

#### Effect on Reproductive Performance

Comfortable bedding improves expression of natural behaviours such as mounting during estrus. Slippery or hard floors suppress estrus activity, reducing heat detection efficiency. Lower incidence of dystocia, retained placenta, and repeat breeding has been observed in animals housed on soft bedding like sand compared to concrete floors.

#### Effect of Bedding Material on Behaviour

Dairy cows spend nearly half of their day lying down. Soft and dry bedding encourages longer lying duration, increased rumination, and reduced standing time. Increased standing is often an indicator of discomfort and stress.

#### Animals housed on sand or straw bedding show:

- More lying and rumination
- Reduced standing and restlessness
- Better feeding efficiency

### Importance of Specific Bedding Materials

#### Sand

Sand is widely regarded as the **gold standard** bedding material due to its inert nature, low bacterial load, excellent cow comfort, and reduced mastitis and lameness incidence.

#### Straw

Straw provides good comfort and longer lying time but requires strict hygiene management to prevent udder infections.

#### Rubber Mats and Mattresses

These reduce impact injuries compared to concrete but may still compromise comfort if not adequately cushioned with bedding material.

#### Compost Bedded Pack

Compost bedding allows natural behaviour, improves leg health, and enhances manure quality. However, careful moisture and temperature management is essential, especially in humid climates.

#### Recycled Manure Solids (RMS)

RMS is gaining popularity as a low-cost alternative, but strict hygiene, regular monitoring, and proper moisture control are crucial to avoid health risks.

### CONCLUSION

Bedding material is a critical factor influencing dairy animal comfort, health, productivity, and reproductive efficiency. Soft, dry, and well-managed bedding reduces lameness, mastitis, and stress while improving milk yield and fertility. Sand remains the most preferred bedding material, while compost bedding and recycled

manure solids offer promising alternatives when managed properly. Selection of bedding should be based on climatic conditions, availability, and farm management practices. Providing appropriate bedding along with good ventilation and hygiene is essential for sustainable and welfare-friendly dairy farming.