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Role of Bedding Material on Animal Behaviour

*Parmar Ankitkumar Dineshbhai[1], Khaire Navnath P.[1], Martha Pasar[2] and Tanvi Thakur[1]
[1]Dept. of Livestock Production and Management, ICAR-IVRI, Izatnagar, Bareilly, India
[2] Dept. of Livestock Production and Management, ICAR-NDRI, Karnal, Haryana, India
*Corresponding Author's email: parmarankit3961@gmail.com

Bedding material plays a crucial role in promoting comfort, welfare, and productivity in dairy animals. Resting behaviour is a priority for cattle, with cows typically spending 8–16 hours per day lying down, and this duration is strongly influenced by bedding quality. Soft, dry, and deep bedding encourages longer lying times, which supports rumination and milk production. Bedding materials are broadly categorized into organic types—such as straw, sawdust, and wood shavings—and inorganic types like sand, gypsum, and rubber mats. Each material has specific advantages and limitations, particularly regarding moisture absorption, bacterial growth, availability, and compatibility with manure handling systems. Ideal bedding should be soft, absorbent, low in thermal conductivity, and economical. Behavioural responses to bedding are closely linked to animal welfare principles, particularly freedom from discomfort, pain, and the ability to express natural behaviours such as resting. Concrete floors negatively impact comfort and can increase leg injuries and lameness, ultimately reducing resting time. In contrast, alternative bedding materials such as sand, straw, sawdust, or rubber mats significantly improve comfort, enhance resting behaviour, and support better overall welfare.

Introduction

First and foremost, aim of bedding material is to provide overall comfort to the animals. It should promote the productivity and well-being of animal (Singh *et al*., 2020). Dairy cattle usually prioritize resting over other behaviours (Norring *et al*., 2008); they generally spend 8 to 16 h/d lying down (Tucker *et al*., 2009). The duration that cows spend lying down depends on the type of bedding material provided, among other factors. Cows prefer to spend more time lying down when the bedding is deep, soft, and dry (Reich *et al*., 2010). Bedding influences the duration in which animals remain lying down and, consequently, the processes of rumination and milk production.

Types of Bedding Material

There may be broadly two types of bedding materials namely, Organic and Inorganic bedding materials. Organic bedding materials includes straw, wood shavings, hay, crop residues, saw dust (Bradley *et al*., 2018), composted manure, wood chips (Chamberlain, 2018), etc. On the other hand, inorganic bedding materials include sand, limestone, gypsum, rubber mattresses (Bradley *et al*., 2018), cement, etc. Wood shavings are generally mixed with sawdust for improved aeration, compact ability, improved tilling process (Janni *et al*., 2006). Chipped wood usage as bedding material may lead to injury due to sharp edges. Pros and cons of organic and inorganic bedding material as per following.

Organic Bedding Materials

Pros	Cons
Absorb moisture	Reservoir of bacterial population
Compatible with manure handling systems	Supports rapid bacterial growth
Readily available	Mastitis infection is more
Cheaply available	May lead to foul smell

Inorganic Bedding Materials

Pros	Cons
Inert in nature	Not readily available
Does not support the growth of bacteria	Not compatible with manure handling systems

Characteristics of Bedding Material and Behavioural Parameters

An ideal bedding material should be light to medium in bulk, exhibit strong absorption, dry rapidly, be soft and compressible, have low thermal conductivity, absorb minimal air moisture, be cost effective, and be suitable for fertilizer use (Lacy, 2002). Bedding quality is determined by moisture, pH, ammonium nitrate content, caking, and water-holding capacity (Gençoglan *et al*., 2017). Straw's low water-holding capacity is attributed to high lignin content and its hydrophobic properties (Boulos *et al*., 2000). In general straw or chaff include as bedding material is between 4-8 kg, sawdust between 6-10 kg and sand between 4-5 kg.

Daily time spend by lactating dairy animal (Grant, 2004): In general lactating dairy animals spend around three to five hour for feeding (9-14 meals/day), 12-14 hr lying/resting, 7-10 hr Ruminating, 30 min Drinking, 2.5-3.5 hr Management activities and 2-3 hr social interactions.

Relationship Between Bedding and Behaviour: The concept of 5 freedom are 1. Freedom from hunger and thirst; 2. Freedom from discomfort; 3. Freedom from pain, injury or disease; 4. Freedom to express normal behaviour; 5. Freedom from fear and distress. Bedding material is related to the Freedom from discomfort in term of moisture, soft surface, and air ammonia, Freedom from pain, injury or disease in term of hoof disease and skin condition, and Freedom to express normal behaviour in term of resting and sleeping behaviour (Ninomiya *et al*., 2008).

Bedding material and Behaviour of newly born animal: Studies consistently show that flooring type greatly affects calf comfort and behaviour. Concrete floors with straw bedding offer the best resting comfort and support longer milk feeding and drinking times. Brick kiln ash flooring leads to more abnormal behaviours and reduced social interaction, while wooden slatted floors increase standing time (Kumar, 2008). Rubber mats and straw bedding provide superior comfort, resting behaviour, and social interaction compared to bare concrete floors (Archana, 2019). Similarly, rubber mats and soil floors promote natural behavioural expression, whereas concrete floors are least suitable for calf welfare (Uppiretla, 2020). Rubber mats also offer the highest comfort for lambs, followed by mud floors, with concrete being the least comfortable (Tharun, 2020). This indicates straw bedding was most comfortable followed by rubber mat, while concrete was least comfortable.

Bedding material and Behaviour of heifers: Cow dung (compost) and rubber floors offered the highest comfort and welfare for Sahiwal cow heifers, followed by sand, while concrete floors were the least favourable for resting and behavioural expression (Gurung, 2020). Similarly, in buffalo heifers, compost flooring provided the greatest comfort, rubber flooring ranked next, and concrete flooring was the least comfortable and most stressful (Shakya, 2021). Similar result was also reported in adult animals.

Conclusions

Concrete bedding adversely affects animal comfort, welfare, and health by increases the risk of leg injuries, lameness, and overall discomfort. This result in reduced lying time and altered natural behaviours. Using alternative bedding such as rubber mats, straw, sand, sawdust, or compost over concrete floors enhances animal comfort and encourages natural resting behaviour.

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