

The influence of bedding material on growth and health of rearing calves - *A warm bed for rearing calves*

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Young calves (>3 weeks) feel best in temperatures between 15 °C and 25 °C. They need extra energy to keep themselves warm at temperatures below that, see also figure 1 (NRC, 2001). That means they cannot devote this energy to growing or resisting diseases. There are a number of ways to support young calves in cold weather and to ensure they do not use too much energy to keep themselves warm. You can give them extra energy in the form of milk, or cover them with a warm bodywarmer. But it is also incredibly important to ensure they have a warm bed.

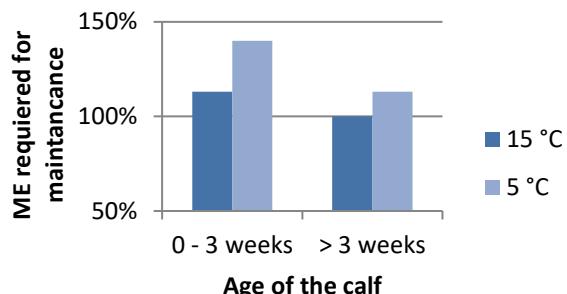


Figure 1. Metabolizable energy (ME) requirement for calves aged 0-3 and >3 weeks in an ambient temperature of 15 °C or 5 °C (NRC, 2001).

Type of bedding material influences growth

A study conducted by the Akey Nutrition and Research Centre in Lewisburg Ohio (Hill *et al.*, 2007) showed that the type of bedding material is of great importance in improving the growth of calves. In this study, 48 calves in experiment 1 and 42 calves in experiment 2 were kept on straw and sawdust respectively at temperatures averaging between -9 °C and 2 °C. The calves kept on straw grew 5% to 12% more during the first 8 weeks and had better feed conversion, particularly in the first 3 weeks. These results show that calves kept on straw use the nutrients from milk and solid feed more efficiently for growth and that they lose less energy to maintenance and thermoregulation. This seems the obvious consequence because straw provides an extra layer of insulation around the calf, provided that it is not wet and that there is sufficient availability of straw in the stable.

Nesting score

But how do you know if there is enough dry, warm straw in the stall? The “nesting score” is a good way of checking this. Researchers at the University of Wisconsin (Lago *et al.*, 2006) describe it as follows (also see photo 1):

- 1) The calf lies on top of the bedding material with the hooves mostly visible
- 2) The calf nestles in the bedding material, but the hooves are visible
- 3) The calf nestles deep in the bedding material with the hooves no longer visible



Photo 1. Example of Nesting Scores 1, 2 and 3 from left to right.

The researchers also examined the effect of the nesting score on the prevalence of lung problems. They observed a lower incidence of lung problems in calves that had a deep bed of straw (score 3) (see also figure 2). In addition, thick barriers between the calves also reduce the likelihood of lung problems, probably because there is less contamination from calf to calf. Calves can create their own microclimate in a deep layer of bedding material by trapping a layer of warm air around themselves in the bedding material. They thus lose less heat and can avoid draught because still air insulates. The calf can then devote the energy no longer needed for heat production to growth and have more energy available for the immune system to resist diseases such as pneumonia.

Air quality

For young calves in individual pens, a crawl space is often made to avoid draught or pockets of cold air. The study by Lago *et al.* (2006) also looked at air quality of individual housing. They noted that the air in a pen with thicker walls and/or a crawl space contained more bacteria. The air in such a dense pen is not refreshed as effectively, which means air quality is an issue. It is thus important to check that the air around the calf does not become too stuffy when using a crawl space. Ask your contact person within Denkavit for advice on crawl spaces.

In addition to providing extra milk in low ambient temperature circumstances, providing a warm bed in winter is exceptionally important. This gives the calf a chance to keep itself warm, helps prevent lung problems and will maintain growth.

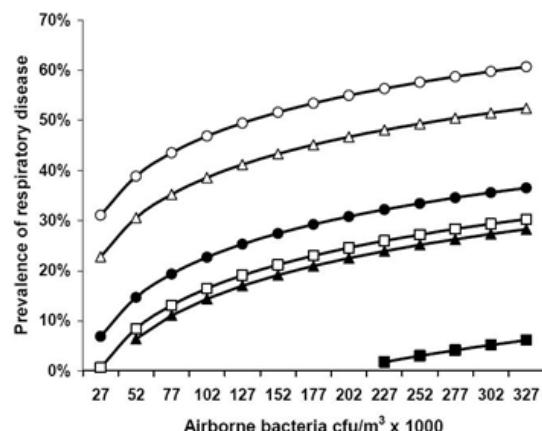


Figure 2. Model of the relationship between bacterial concentration in the air and the prevalence of lung problems in calves in combination with nesting score and type of pen partition. Nesting score 3 and thick pen partition; nesting score 3 and open pen partition (Lago *et al.*, 2006).

Referenties:

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