Using recycled manure solids as a bedding material in a freestall dairy barn

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DairyCare

cost

The European Agricultural Fund for Rural Development: Europe investing in rural areas

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Long used, little studied

Recycled manure solids (RMS) have been used as a bedding material since 70's in North America.

Today RMS is growing its popularity also in Europe

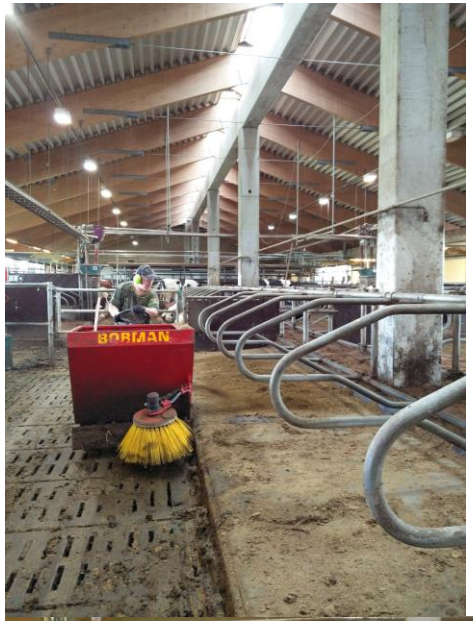
➡ However, there is only little research done on animal welfare and helth effects of RMS

Advantages:
- Renewable
- Not abrasive
- Economical

Risks:
- SCC
- Animal/human health
- Management

Management is important!
- Use fresh! No out of control heat production.
- Keep stalls clean
- Milking hygiene

Experimental design



2 x 24 cows
2 x 3 months
RMS vs. peat

Untreated solid part from separated raw manure.

Udder health
Lameness/hoof health
Skin alterations
Cleanliness
Lying behaviour and activity

Other experiences on use
- Spreading methods
- Dry matter content

Bedding

- Adding fresh bedding three times a week
  - Minimum of 10 l/stall/day, about 500 liters on a single spreading
  - Mechanical spreading (Bobman)
- Screw separator (Bauer Separator S 655), sieve 0,5 mm
- Dry matter analyzed once a week
  - After separation
  - Before spreading

Recommended DM 35%

	Dry matter %	SD	Min	Max
From separator	23.8	1.3	21.9	26.7
From Bobman	24.6	2.0	20.1	27.7

Udder health

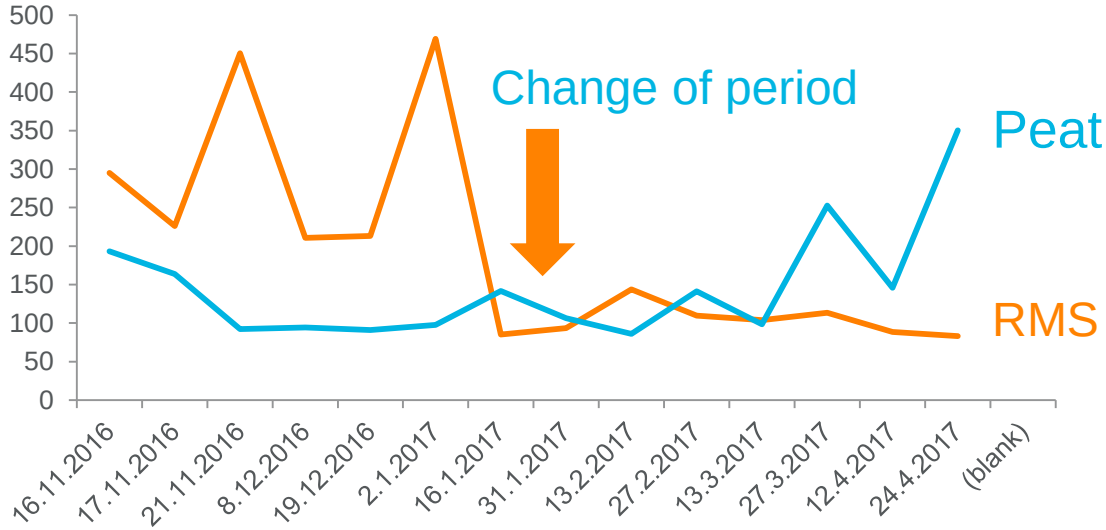
Milk samples every two weeks

Somatic cell count (1000 cells/ml)

BoxCox transformation, λ = -0,3
Mixed linear model, independent variables:

- Bedding material
- Animal group
- Study period
- Parity
- Milk production

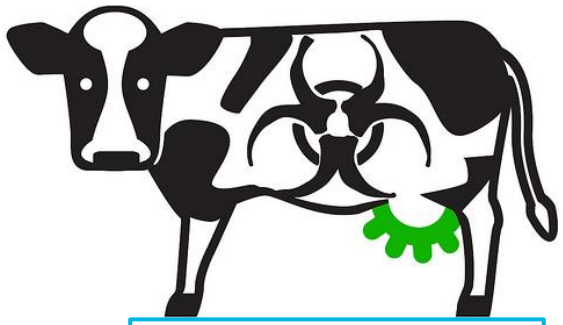
No statistically significat difference in SCC between bedding materials.



Animal group $p < 0,05$
Parity $p < 0,0001$
Milk production $p < 0,001$

Bacteriological milk samples

- Most prevalent finding with both beddings was CNS
  - Normal flora on skin, not neccessarily connected to environmental factors
  - Often subclinical cases
- **”Environmental” mastitis** occurred four times
  - Cases only with RMS and on first study period
  - E.coli , Str. Dysgalactiae, 2 x Str. Uberis
  - → Two of these cases had high SCC rest of the experiment (CNS/no finding)



>400 000 cells/ml

	Whole herd 2016, %	Experiment, %
Str. uberis	5.8	3.6
Str. dysgalactiae	2.3	1.8
E. coli	1.8	1.8
Total	**9.9**	**7.2**

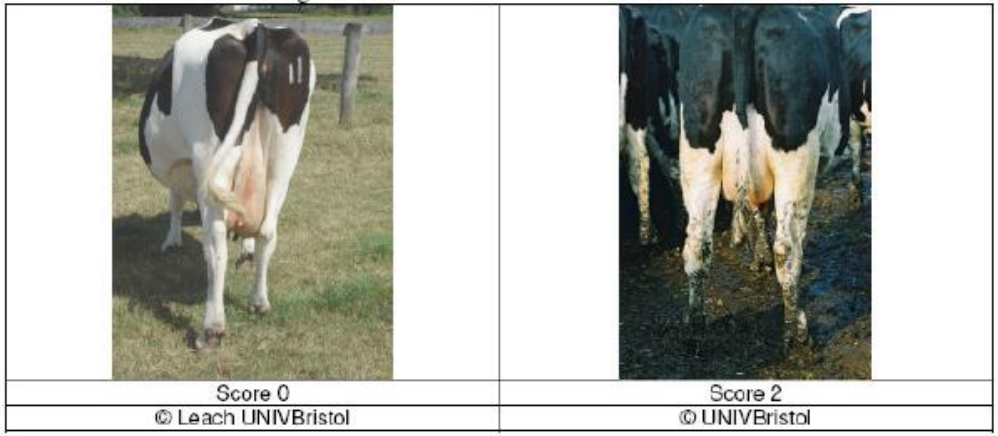
Connection between environmental mastitis cases and RMS cannot be ruled out. However, these cases were occasional and cotrollable.

Cleanliness

Scoring based on Welfare Quality® every two weeks:

- Hind legs
- Hind quarter
- Udder

→ Clean vs. dirty



Generalized estimating equations (GEE)

- Bedding material
- Study period
- Animal group

Bedding material affected only cleanliness of udder ($p < 0,05$):

- **With RMS there was 1,5 higher odds to get score clean compared to peat**

Note! Lack of physical dirt does not mean that there is no pathogens on the skin surface.

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Conclusions

- Cleaner udders with RMS
- No effect on SCC
- Connection between environmental mastitis and RMS cannot be ruled out →However, occasional and cotrollable cases

Management is important!

- Use fresh! No out of control heat production.
- Moisture and high temperature in barn promote microbial growth.
- Stall hygiene! Remove wet and dirty bedding regularly.
- Overall cleanliness → floors, stalls, milking!

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