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Grass cover retained by nose-ringing of outdoor sows only partially reduces the risk of N leaching

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In Denmark it is common practice to nose-ring outdoor sows. In the UK and the Netherlands this is prohibited in organic farming. The purpose of the ring is to reduce rooting and digging, which damages the grass sward. A well-maintained grass sward is important for environmental reasons as it absorbs and preserves nutrients excreted during grazing.

Furthermore, grass may constitute a significant part of the energy requirement of the sows and high levels of grass cover seem to decrease piglet mortality.

A compromise

Although the ringing of sows may not cause suffering, it conflicts with the organic ideals that natural behaviour and behavioural needs of animals should be taken into consideration. It has been demonstrated that rooting is the preferred explorative behaviour of pigs and it is considered a behavioural need. Therefore the ringing is a compromise of the organic principles and it is relevant to ask whether the environmental gain of the ringing justifies this compromise and if grass cover can be maintained in other ways.

During a study at the Danish Research Centre for Organic Farming we have investigated the effect of nose-ringing for both pregnant and lactating outdoor sows. The objectives of the study were to examine concomitantly the effects of nose-ringing and animal density on:

- animal performance,
- foraging and explorative behaviour,
- grass cover,
- nutrient excretion and distribution, and interactions between these observations.

Only the results in relation to grass cover and nutrients are mentioned here. A full report of the experiment is under way ([see project homepage](#)).

Better grass cover with ringed sows

The experiment that took place from May to the end of September included both ringed sows and unringed sows (**Table 1**). For unringed sows the paddocks were either used continuously throughout the experiment or divided

into two and sows were moved half way through the experimental period.

Not surprisingly, it was confirmed that grass cover was better preserved where sows were ringed (**Figure 1**). As there was always less grass in paddocks with pregnant sows compared to lactating sows, the effect of ringing was more pronounced here. On average, ringing increased grass cover from 14 to 38% and from 64 to 81% in paddocks with pregnant and lactating sows, respectively. Treatment 3 (**see Figure 1**), where paddocks were used by either a single sow or by a group of sows before abandonment, gave different results for different types of sows. With lactating sows grass cover was much reduced, especially at the autumn measurement where intensive use reduced grass cover from 64 to 28%. For pregnant sows there was no effect of grazing intensity at the summer measurement and in treatment 3a the re-growth of the grass in the paddocks used only in the first half of the experiment gave a more extensive grass cover in the autumn, than those with ringed sows.

To determine the nitrogen loss potential soil samples were taken from local areas in the paddocks for soil inorganic N analysis. In lactating sow paddocks the level of inorganic N was high but with no significant relation to extent of grass cover (**Figure 2**). The nutrient load in some places probably considerably exceeded the uptake capacity of the grass. In pregnant sow paddocks the soil inorganic N content was significantly reduced by increased grass cover and at 60% grass cover soil inorganic N content was at a low level.

Management options

It is difficult to give a definitive answer as to whether nose-ringing of sows should be practised. because we need investigations including a wider range of outdoor production systems and partly because it is a question of attitude how we prioritise animal welfare against the environment. Furthermore, having grass cover in outdoor pig production systems seems to be important for the image of organic production.

However, from the experiment it was evident that although ringing did have a positive environmental effect, it was not the main factor influencing potential losses. Management choices in terms of feeding, animal density and nutrient distribution are at least as important. Thus, nose-ringing may be considered the farmers' method of maintaining grass cover but without guaranteeing low environmental load.

On the other hand, if no nose-ringing of outdoor sows is the preferred option, this may be environmentally justifiable if sward damage is dealt with by e.g. gradual expansion of the paddocks and a general increase in the area of grassland used for the sows.

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