

# IGN-Research Award 2021

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„Rooting for feed: Mixing corn pellets into rooting material tends to increase the presence of growing-finishing pigs in a rooting area but not its cleanliness“

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## Summary

The welfare of fattening pigs depends in particular on whether the housing environment enables them to perform natural behaviours. Exploration is an intrinsic behavioural need in pigs involving rooting, sniffing, chewing and manipulation of numerous items. Rooting is characterised by digging, grubbing and scooping with the snout, raking with the forelegs and chewing or gnawing items turned up by these activities. Therefore, an environment that allows pigs to root in appropriate material is expected to enable species-specific behavior and thereby improve their welfare.

While the EU-regulation Council Directive 2018/848/EC for organic agriculture obligates farmers to provide pigs with permanent access to an outdoor area, it only specifies minimum space requirements and that the exercise area permits dunging and rooting without specific details regarding the overall design. In practice, a typical outdoor area for organic growing-finishing pigs often consists of a barren area with partially slatted floors, which is mainly used for elimination, therefore meeting only one of the two requirements according to the EU regulation. Although some straw might be present, generally, no specific rooting area is demarcated in the outdoor run.

Though it has been shown that rooting areas make the outdoor run more attractive to pigs and contribute to overall cleanliness of the outdoor area, knowledge is lacking on the design of such areas to ensure “good functioning” i.e., being used by the pigs for exploratory but not for elimination behaviour. This is important since a soiled area is positively correlated to higher ammonia emissions and could result in health problems (e.g. endoparasite accumulation).

Therefore, the main objective was to study the effects of mixing corn pellets into rooting material on the use and cleanliness of the rooting area in organic growing-finishing pigs under commercial organic conditions.

To test our hypothesis based on the fact that pigs avoid elimination close to resources such as food and water, we constructed rooting areas filled with compost in four pens on an organic farm. For the experiment, we compared two experimental pens with rooting areas filled with compost, in which we mixed 2 kg of corn pellets every morning, with two control pens (rooting areas filled with compost only). We chose to investigate this type of feed as it was locally available on the farm but not too expensive and therefore suitable for future use. We registered behaviour once a week through direct observations of the complete outdoor area and additional video recordings of the rooting area. Behavioural variables of interest were activity status (i.e. standing/sitting or lying), rooting, agonistic and play behaviour. We assessed cleanliness of the rooting material via visual scoring and chemical analysis of compost samples. The latter included tests on dry matter content, conductivity, and ammonium concentration. Data were analysed with linear mixed-effects models.

The results showed that there was a tendency for a higher total number of pigs in the rooting area in the experimental compared to the control groups. However, there were no differences between treatments in rooting behaviour. Moreover, the total use of the run did not differ between treatments. In addition to these primary results, we noted several secondary findings. First, as expected, time of day was found to influence all recorded behaviors in the rooting area. Furthermore, as temperature increased, more animals were present in the outdoor run and the rooting area in both treatments. Conductivity and ammonium concentration in the compost increased the longer the compost was in the rooting areas, but there was no difference between the two treatments.

The results of this research allow the conclusion that that mixing corn pellets into rooting material tends to increase the presence of growing and finishing pigs in a rooting area but not its cleanliness. Generally, we found that pigs used a rooting area filled with compost a lot, regardless of additional feed. Therefore, the areas seem to be very attractive for the pigs.

### **Take Home Message**

Good functioning rooting areas, that are integrated in outdoor runs, allow pigs to satisfy their need for exploratory behavior and make the out-door runs more appealing for pigs. Different substrates can be used as rooting material but soil-like materials including thermally

sanitised compost are preferred for rooting by pigs. Depending on climate they are used for rooting behaviour but also for resting. Sometimes pigs use the rooting area also for elimination behaviour, especially when the rooting material is already wet. This is important since a fouled pen area positively correlates with higher ammonia emissions and could also result in health problems due to impaired hygiene. Mixing of corn pellets into compost of a rooting area tends to increase its overall use and increases its use as lying area but does not affect the areas' cleanliness.

### **Vita**

Since 2021: Visiting Scientist at the Humboldt University Berlin

2018 – 2020: MSc Organic Agriculture at Wageningen University & Research, Chair group of Animal Production Systems and master thesis in cooperation with FiBL Switzerland

2018: Internship in the sector programme Sustainable Agriculture at the German Corporation for International Cooperation (GIZ)

2016 – 2018: Project assistance at FiBL Germany and bachelor thesis

2014 – 2018: BSc Agricultural Sciences at the Georg-August University of Göttingen with focus on Economics

### **Source**

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