

# Automatic manure scrapers for reduced ammonia emissions

## Problem

The greatest environmental impact from pigs housed in stables with access to a concrete outdoor run is related to the risk of high ammonia emissions from excretions in the outdoor run. Ammonia emissions increase exponentially with higher temperatures.

## Solution

A more frequent removal of manure from the toilet area reduces ammonia emissions and thereby reduces the environmental impact of organic pig production. Automatic scrapers on the outdoor toilet-area give farmers the possibility to increase scraping frequency, while reducing the workload.

## Impact

Automatic scrapers remove manure daily or several times per day, if needed. Daily scraping of the toilet area during the summer considerably decreases ammonia emissions, compared to scraping 1-3 times a week, since a dry and clean area has hardly to no detectable ammonia emissions.

## Practical recommendation

- **Automatic scrapers can either be installed when a new outdoor run is build, or can be retrofitted to existing outdoor runs. If automatic scrapers are retrofitted to existing outdoor runs, adjustments in the layout may be required and entail additional costs. Furthermore, not all outdoor runs may be adaptable to retrofitted systems.**
- **The outdoor area should be designed in a way that motivates pigs to choose a small sub-area as toilet for excretion behaviours. To achieve this, provide lying and feeding areas indoors and keep them as dry as possible. Add roughage or rooting areas in the outdoor run to further reduce the total area used for excretion.**
- **Increase the frequency of manure removal during warm periods of the year to decrease ammonia emissions.**
- **It is important to have a good drainage of the outdoor run, especially to dry up wet concrete areas not covered by automatic scrapers.**
- **Cleaner outdoor areas also reduce soiling of the indoor areas, and thereby lower the workload for cleaning or renewal of the bedding material.**
- **Ensure good manure management to reduce the overall ammonia emissions of a farm. This includes:**
  - frequent removal of manure;
  - a covered manure storage; and
  - the incorporation of manure into the soil within a few hours after spreading it on cultivated fields.

## Applicability box

### Theme

Pigs, concrete outdoor runs

### Keywords

Automatic scrapers, ammonia emissions, manure, hygiene, outdoor run

### Geographical coverage

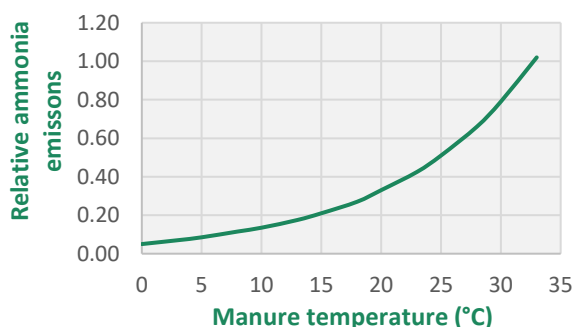
Most advantageous for farms in warmer climates

### Application time

Daily

### Equipment

Automatic scraper



**Figure 1 (left):** Graph on the relative ammonia emissions in relation to manure temperature.

**Picture 2 (right):** Outdoor toilet area with automatic scrapers.

## Further information

### Further readings

- Salomon E, Mjöfors K, Tersmeden M (2020) Ammonia emissions from outdoor fattening pigs on concrete pad – a farm case study. Video Pre-Conference on Animal Husbandry 21-22 September 2020 linked to the 20th Organic World Congress 2021 Organized by IFOAM Animal Husbandry Alliance (IAHA).

### Weblinks

- Check the [Organic Farm Knowledge Platform](#) for more practical recommendations.

## About this practice abstract and POWER

**Publisher:** Research Institute of Organic Agriculture (FiBL)

**Authors:** Linnea Bark, Eva Salomon, Rennie Eppenstein

**Contact person:** Linnea Bark, linnea.bark@ri.se

**Permalink:** <https://orgprints.org/39893/>

This practice abstract was elaborated in the POWER project. The project is running from March 2018 to March 2021, as part of the CORE Organic Cofund.

**Project website:** <https://projects.au.dk/coreorganiccofund/core-organic-cofund-projects/power/>

**Project partners:** Universität für Bodenkultur Wien (BOKU), Thünen Institut für Ökologischen Landbau (TI-OL), Center of Development for Outdoor Livestock Production (UHF), Wageningen Livestock Research (WUR), Research Institutes of Sweden (RISE), Council for Agricultural Research and Economics (CREA-ZA), Institut national de recherche pour l'agriculture, l'alimentation et l'environnement (INRAE)

© 2021