Improved concrete outdoor runs in housing systems for growing-finishing pigs: showers

Description

Heat stress during summer is increasingly challenging for pigs. Showers are a practical solution to provide cooling in the concrete outdoor run. For this purpose, devices for plant irrigation (tubes, nozzles) can be easily adapted. Different flow rates and droplet sizes can range from "rain-like" to "mist-like" showers. Time and frequency of shower activation can be regulated automatically with simple timers or more complex irrigation computers with possibilities for programming diverse irrigation schedules.

Applicability box

Theme
Pigs
Farm type
Indoor housing with outdoor run
Production stage
Sows + boars, growing-finishing pigs

Welfare Environment Cost

Legislation

- EU organic Regulation 2018/848 stipulates that: "Open air areas shall provide (…) means allowing the regulation of body temperature of porcine animals."
- Danish industry agreement requires all pigs over 20 kg to have access to a wallow or sprinkler when the average daily temperature exceeds 15 °C.
- Swiss Animal Protection Ordinance (AniPO, SR 455.1) stipulates that: "In new pig barns, during hot conditions, pigs weighing 25 kg or more and kept in groups as well as boars must be provided with cooling facilities. These can be e.g. air cooling, floor cooling, fogging systems, showers or wallows.
- The Bio Suisse standards requires a shower or wallow for all pigs except lactating sows with piglets at outside temperatures of 25 °C or higher.

Relevance for animal welfare

Pigs cannot sweat. Therefore they need other opportunities for thermoregulation, e.g. by evaporative cooling through wetting their skin with water.

In indoor housing with concrete outdoor runs, showers have been shown to reduce heat stress and increase feed intake and weight gain during the hot summer period. Showers reduce pigs' skin surface temperature and the wet floor provides a cool lying underground. Moreover, pigs in the outdoor run are more active and show less lateral lying, which indicates reduced heat stress.

Pigs show various water-related behaviours, e.g., standing and/or drinking under the shower with the head lifted, wriggling, shaking, rubbing their skin against pen fixtures or brushes.

In addition, showers increase cleanliness of pigs and the pen.

"Mist-like" showers spray small droplets over the outdoor run, helping pigs to cool down.

Relevance for environmental impact

- Water is a valuable and often scarce resource. The water consumption of showers depends on the flow rate, duration and frequency of shower activation. Optimising the flow rate and schedules for shower activation can save a lot of water. However, flow rate and droplet size should be high enough to wet the skin surface of pigs for evaporative cooling.
- Showers increase the cleanliness of the pigs and the pen and therefore potentially reduce the ammonia-emitting surface in the outdoor run.
- Added water in the manure lowers the ammonia concentration in the manure so that less ammonia is emitted to the air. This effect increases with higher quantity of water, depending on flow rate, duration and frequency of shower activation.

Cost and labour

- Companies offer sprinkling systems for cooling with more technical refinement. However, the costs and effort of installation are usually higher than simple self-made solutions.
- Material meant for garden irrigation, such as lawn sprinklers, is generally less costly and can be adapted to a wide range of housing systems with relatively low effort.
- Nozzles known for cooling systems for dairy cows ("fogging systems") are a good and cost efficient option.
- Water availability needs to be considered.
- Workload is very low, especially when the showers are regulated automatically. Work related to cleaning of pens is potentially reduced (less dirty, easier to clean).
- Additional water in the manure needs to be considered for storage and application to fields.

Under rain-like showers pigs get wet faster compared to mist-like showers. Observations also show that pigs interact more with the water from rain-like showers.

Recommendations / requirements

- **25 °C:** Showers and sprinklers should be activated when ambient temperatures exceed 25°C.
- **Bodyweight:** Showers are particularly important for pigs with a bodyweight higher than 60 kg (sows, boars and finishing pigs). Suckling and weaner piglets have different temperature requirements and rather avoid showers.
- **Lactating sows with piglets:** Showers are easy to implement in outdoor runs for pregnant sows. For lactating sows the location must be carefully considered not to affect suckling piglets.
- **Outdoor run size:** There should be enough space, so pigs can avoid the showers and can lie undisturbed in a dry area.
- **Location:** Preferably, showers are located in the open/non-roofed area of the outdoor run and away from the bedding material or feeders.
- **Slatted / solid floor:** Drainage is essential, but the use of solid floor is possible, with the advantage that it stays wet and cool for a longer period.
- **Further enrichment:** After showering or wallowing, pigs like to rub their skin, e.g., against brushes or tree trunks.

Further information

- **Bio Suisse (2021)**: Standards for the production, processing and trade of "Bud" products. At: partner.bio-suisse.ch [Link].
- **EAER (1997)**: EAER Ordinance on organic farming SR 910.181 of 22 September 1997 of the Federal departement of economic affairs, education and research (EAER). At: www.fedlex.admin.ch [Link].
- **EU (2018)**: Regulation (EU) 2018/848 on organic production and labelling of organic products. At: eur-lex.europa.eu [Link].
- **Huynh T.T.T. et al. (2006)**: Effects of tropical climate and water cooling methods on growing pigs' responses. Livestock Science 104: pp. 278–291 [Link].
- **Olsen A.W. (2001)**: Behaviour of growing pigs kept in pens with outdoor runs II. Temperature regulatory behaviour, comfort behaviour and dunging preferences. Livestock Production Science 69: pp. 255–264 [Link].

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