

Effect of drinker type on slurry production and costs of storage system in growing-finishing swine units at Santa Catarina's state, Brazil

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Abstract

Nowadays, some producers at Santa Catarina's state, Brazil (fourth largest producer and exporter of the world) still exhibit difficulties in complying with the present legislation, either by the volume of slurry that is produced at their units, either by the problems observed in the design of the collect systems, storage and treatment. Facing this scenario, the solution involves the application of slurry produced in the soil, randomly (area available reduced), disregarding the legal storage period (120 days), the volumes pre-established (50 m³•ha-1•year-1) and the fertilizer recommendations given by the technical report based on soil analysis. The reference values of Environmental Foundation at Santa Catarina's state (data from 1993 for growing-finishing: 7 L•pig-1•d-1) are used to determine the average of slurry produced at the units and to scale in design, the storage and treatment systems. The implementation costs of storage system (dunghill) ranges currently between 25 € to 11€, if we consider commercial production units with 300 or 2500 swine's at growing-finishing phase, respectively. This study aimed to determine the slurry production by growing-finishing pigs in fifteen production units, to compare the results obtained with the reference values and to establish the effect of the slurry reducing volume in the implementation costs of a storage system.

In the field experiment were monitored 17 cycles of production in growing-finishing phase on 15 different commercial units since April to December 2011, considering three housing periods (t=10, t=15 e t=18 weeks) and three different types of drinkers for water intake [Ball Bite (BB), Nipple (NI) and Bowl (BO)]. The study was conducted in West region of Santa Catarina's state, Brazil. The measurement of the slurry produced was performed by daily producer observation (24 hours period) of the volumes deposited inside fiberglass boxes with 5 m³. These boxes were installed between the housing building and the slurry storage system in each production unit. Each day at the same hour, the producer measures the height of stored volume. Through specific equations the volume of slurry produced was determined.

The results obtained showed that in the 17 cycles monitored and evaluated, swine produced an average of 4.20, 4.58 and 4.84 L•pig-1•d-1 of slurry, independently of the type of drinker installed (t=10, t=15 and t=18 weeks, respectively). Furthermore, considering the drinker installed the slurry produced (average) presented significant differences between units with BB compared to the others (NI and BO) for the F test (P≤0.05). Except for the t=10 weeks period, the NI units had the lowest slurry production mean. In comparison to other studies [1] [2], the slurry produced at NI units was similar or lower. It is important to emphasize that the results obtained for the slurry production during the experimental study, were lower than the values currently used by the environmental foundation in Santa Catarina's state. Considering two units with 300 animals and 15 weeks housing at growing-finishing phase (drinkers: BB and NI, respectively) it is possible to indicate that the producer with nipple drinker saves 945€ in the total costs of storage systems for each production cycle (slurry produced: BB – 5.35±0.20 L•pig-1•d-1; NI – 4.15±0.21 L•pig-1•d-1).

The averages obtained for the slurry production were smaller for all housing periods considered when compared to the reference values. The results exhibited significant differences between the units with BB drinker and others (NI and BO). In the future, these new results can be used for all the parts involved in the production, regarding the design and costs of the storage structures. It can also be used for planning the slurry final discharge, both for agronomic and energetic valorization regarding the new values determined.

References

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Keywords

Pig farming, growing-finishing, slurry production, implementation costs