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Effect of room temperature and feeding level on growing finishing pig performance

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► **To cite this version:**

J. Le Dividich, B. Desmoulin, Jean-Yves Dourmad. Effect of room temperature and feeding level on growing finishing pig performance. *Annales de zootechnie*, 1985, 34 (3), pp.374-375. hal-00888406

HAL Id: hal-00888406

<https://hal.science/hal-00888406>

Submitted on 11 May 2020

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VI. — HOUSING AND ENVIRONMENT

Pig pathology in relation with the evaluation of pig houses

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Housing conditions may have an unfavorable effect on animal health, especially in intensive rearing conditions. Some pathological cases may be related to particular aspects of the pig houses and a more precise diagnosis of herd health and housing conditions can be made. Accordingly, improvements or arrangements of the piggery may be much more efficient if they are performed also on account of animal health criteria.

Modelling of thermal conditions in pig rearing houses

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A computerized model was developed by C.E.M.A.G.R.E.F. to simulate the inner temperature of a pig house using climatic data and thermophysical parameters from a given piggery. It was based on a theoretical model of thermal conditions within a pig house (WUCHNER, 1983) This model allowed to explain 70 to 75 p. 100 of the total variation in the room temperature and using regional climatic data to define the thermophysical characteristics of the pig house maintaining the optimal temperature.

**Effect of room temperature and feeding level
on growing finishing pig performance**

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Two trials were made in 36 castrated male pigs to determine the effect of room temperature and feeding level on the growing-finishing performance. Animals were kept in individual pens on concrete slatted floor at a room temperature of either 12 and 20 °C (trial 1) or 20 and 28 °C (trial 2). Three levels of feeding were associated to each tempe-

perature in each trial : trial 1, at 12 °C, 2600, 2300 and 1975 g/day; at 20 °C, 2510, 2300 and 2000 g/d; trial 2, at 20 °C, 2530, 2230 and 1900 g/d; at 28 °C, 2200, 1900 and 1600 g/d. The diet based on maize and soyabean meal included 3.3 Kcal DE/g.

The temperature \times level of feed intake interaction was not significant for any of the criteria considered. Growth rate increased linearly ($P < 0.01$) with the amount of feed intake. At 12 and 20 °C (trial 1) reduction of the feeding level by 1 g/d was accompanied by a decrease in the growth rate of 0.37 ± 0.05 g/d; at 20 and 28 °C, the corresponding value was 0.39 ± 0.02 g/d. With the same feeding level, a 1 °C reduction of room temperature in the 28-20 °C interval caused a lowering of weight gain of 6 g/d, on an average; between 20 and 12 °C the corresponding value was 14.3 g/d. Feed conversion ratio increased with a reduction of room temperature of 0.14 unit ($P < 0.05$) between 28 and 20 °C and of 0.39 ($P < 0.01$) between 20 and 12 °C. The same growth rates were obtained at 20 and 28 °C and at 12 and 20 °C by a supplementary dietary supply of 16 and 38 g/d by degree of reduction of the room temperature in the 28-20 and 20-12 intervals, respectively.

The decrease in feeding level led to a linear increase ($P < 0.01$) in the loin/backfat ratio and muscle percentage and to a linear decrease ($P < 0.01$) in the carcass fat percentage. With the same level of feed intake, there was no difference in the fattening performance between animals kept at 20 and 28 °C. At 12 °C, carcass adiposity estimated by the loin/backfat ratio and the muscle percentage was lower ($P < 0.05$) than at 20 °C.

All these results suggest that the effect of low temperatures on fattening performance is similar to that of restricted feeding and that a high temperature (> 20 °C) may lead to feed sparing.

Testing of two ways of keeping up a minimal rate of ventilation in a fattening house

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Two different ways of keeping up animal rate of ventilation were tested in fattening houses. Maintaining such a rate is a technological problem, the practical rate being often too high. Our aim being that the indoor ventilation system provides a variation ranging from ten to hundred percent, we designed two different simple apparatuses : one with fans running and stopping in turn while on minimal rate and the other with fans running steadily while providing a specific mixture of fresh and indoor air so that the rate of fresh air should be equivalent to the chosen minimal rate.

Two different trials at different seasons were performed on both techniques in two different fattening houses containing 80 pigs. The animals displayed no significant differences of their growing characteristics in spite of slight intestinal affections. The main results were indoor climatic improvements, i.e. temperatures ranging from 14 °C to 19 °C and daily temperature variations below 8 °C. No heating or extra insulation were then required. Both systems used pressure ventilation which shows the benefit of such a choice.