

INFLUENCES OF DIFFERENT ENVIRONMENTAL CONDITIONS ON THE STATUS OF PRODUCTION AND PHYSIOLOGICAL PARAMETERS IN WEANED PIGLETS CAGED IN A BATTERY SYSTEM.

R. KOŁACZ, Z. PEJSAK^x, Z. DOBRZAŃSKI

AGRICULTURE UNIVERSITY IN WROCLAW, DICKSTEINA 3, 51-617 WROCLAW, POLAND

THE VETERINARY RESEARCH INSTITUTE, PARTYZANTOW 57, 24-100 PULAWY, POLAND

(title, author's, and address in this section.)

The battery system of caging swine brings about many difficulties in stabilizing an adequate microclimate in all levels of the cages. In such housing the proportionally small area is largely crowded and in addition the levels of caging cause serious difficulties in equalizing circulation of fresh air in the building and between the horizontal and vertical rows of cages.

The purpose of this work was to study the statistical differences in basic microclimatic parameters of the battery housing weaned piglets and what influences were of the different microclimatic conditions on weight gain, heat and some physiological values of the weaned piglets.

Materials and methods

The battery of cages was in a room which had the dimensions: 26.88 m. x 16.71 m. x 2.30 m, 4.12

In this area were 6 rows of cages, 3 levels and room for 1920 head of weaned piglets.

Each animal had 0,2 m² of space. The air circulation system was mechanical ventilation under pressure. The experiment was conducted during the weaned stage of the piglets in the winter. Measurements of the microclimate were taken at the heights of 40 cm-level I, 140 cm-level II and 220 cm-level III. Biochemical and haematological blood investigations were made as well as clinical and anatomopathological investigations of those animals which were sick or died during the experiment. Weight gain were also under control.

Results

Thermal-humidity conditions varied greatly depending on height. When the outside temperature fell below 0°C, this affected a larger temperature gradient on the different levels of the battery.

Air movement was different within each level of cages. The greatest circulation was found in the top and bottom levels.

Relative humidity was greater in the bottom cages and lesser in the top cages.

In comparing the values obtained from microclimates of the 3 battery levels it was found, that the most advantageous thermal conditions were in the levels III and the worst conditions were in the levels I. The largest weight gains in the weaned piglets were obtained in the level III with a mean of 423 g/day, whereas the worst and lowest gains were in the level I with a mean of 396 g/day. During the first 52 days there was a 7,8% mortality rate: 3,7% in level I, 2,8% in level II and 1,3% in level III.

The biochemical and hematological blood investigations /tab.1,2/ indicated, that the worst microclimatic conditions with large influence upon decreasing immunity and appearance of subclinical disease symptoms in weaned piglets were found in the level I of cages. The RBC blood count was also found to be 15,4% higher in the weaned piglets kept in the top level than those kept in the bottom level. The glucose level was 24% higher in blood of piglets kept in the level I comparison to piglets from level III. Glucose level exceeded the value of 90 mg%, indicate status of hyperglycaemia.

Total protein content in the weaned piglets from the level I was by 14% lower than that

in piglets from the level III.

Table 1. Some of the results of hematological investigations in weaned piglets caged in battery system.

Cage level	Parameters		
	Red cells 10 ⁹ /mm ³	haemoglobin content g/100 ml.	haematological index %
III	8,60 ± 1,24	10,15 ± 1,10	31,30 ± 5,25
II	8,20 ± 1,56	9,83 ± 0,47	31,72 ± 5,36
I	7,12 ± 1,74	8,74 ± 0,34	30,61 ± 6,85

Table 2. Some of the results of biochemical investigations in weaned piglets caged in battery system.

Cage level	Parameters			
	glucose mg/%	cholesterol mg/%	total protein g/100ml	albumin %
III	73,5 ± 24,5	103,5 ± 23,1	9,12 ± 0,87	47,3 ± 5,3
II	778,3 ± 15,4	105,1 ± 19,8	9,29 ± 0,72	46,7 ± 4,1
I	96,6 ± 16,7	106,8 ± 24,5	8,13 ± 0,95	48,4 ± 7,2

Conclusions

1. Large differences in the microclimate environmental conditions were found within the three levels of the battery. These differences were dependent on the level. The most advantageous conditions were consistently found in level III /top/ and the worst in level I /bottom/.
2. The non advantageous thermal-humidity conditions in the height of level I were the cause of lesser body weight gains and worse physiological blood indexes.

Selected references: Grzegorzak Z., Kołacz R., Dobrzański Z.: Untersuchungen über den ... Proc. des III International Kongress für Tierhygiene, Wien, 1980. Miller E.R.: J. Anim. Sci. 20, 890, 1961. Marx D., Würner R.: Tierzüchter 25, 474, 1973. Newland H.W., Mc Millen W.N., Reinke E.P.: J. Anim. Sci. 11, 118, 1952. Marx D.: Tierzüchter 12, 335, 1974. Tegge G.: Kraftfutter 52, 86, 1976.