THE INFLUENCE OF THE ENVIRONMENT ON SELECTED PARAMETERS OF PIG PRODUCTION

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Summary

The growth curve of fattened pigs were analysed during the long-term experiment accomplished in various macroclimatic condition. The pigs stabled in stalls with total slotted floor, on dry regulated feeding, power-ventilated rooms with the air temperature control. The results are evaluated from the point of interaction between the temperature, feed consumption and the body mass increase during production cycles accomplished in various seasons of the year. The assessment of results takes into account the compensation of temperature differences during the frosty winter and hot summer seasons on the economy.

Key words: fattening pigs, growth curve, stable environment

INTRODUCITON

The environment in which pigs are expected to live and grow is really the composite of many environmental factors. These factors interact with each other. This makes difficult to identify exactly which external condition is causing pigs to perform poorly (Holis, 1996).

Pigs are extremely plastic, adaptable creatures (Hale, 1969; Budiansky, 1992), but even pigs have limits to their adaptability, and practical environments can be so poor as to not fall within these limits.

Dirty, less hygienic environments increase the level of immunological stress and depress growth and performance of pigs (Johnson, 1996).

MATERIALS AND METHODS

During a nine production cycles of fattening our attention was paid to the influence of the climatic factors, expressed in changes of the local climate within the seasons of the year on the course of pigs fattening in the specialized farm. Study was made in farm for fattening pigs with stables for 400 items with total slotted floor with dry feed to the group feeders. The stable was thermal insulated with regulated forced ventilation system.

The objectives of our observations were the body mass growth of pigs during the whole fattening from the body mass 28 kg to the body mass of around the 112,3 kg. As follows from the tab.1, into our observation were selected the individual fattening batches they did start close to the beginning of a month. We did investigate the body mass increase in relation to the time necessary for reaching the slaughter body mass of about 110 kg, average daily body mass increase, the feed conversion ratio, the amount of the feed consumed per a feeding day, the frequency of forced slaughters and mortality during the observed fattening periods.

RESULTS AND DISCUSSION

The results are presented in the table 1. and visualized in the graph 1. The period of around 110 days, necessary for the increase of the body mass from around 30 to 110 kg is spread in the interval of a little more than three month. The climate in our latitude exhibits remarkable variations expressed in the average daily temperatures lower than the zero of centigrade during the winter season, over the daily average around the 10 to 15°C during the spring and autumn, up to the 25 °C or more in the summer. Namely the hot summer temperature is a serious danger, because it is difficult to maintain the appropriate stable climate suitable for welfare of the fattened pigs e.g. the optimum temperature and humidity within the stable. This burden of high temperature and humidity in the stable is succeeded by the decrease of body mass increase (graph 1), and the increase of various health hazards they do often end by death or a emergency slaughter (graph 2).

Pigs have the ability to quickly respond to environmental stress. Swine managers must also keep changes brought on by the time of day or the season in mind when evaluating the environment inside the hog building. This is especially important during the season when the weather is in transition. The warm days and cool nights most parts of the country are now experiencing can cause extreme environment stress for hogs if buildings are not managed properly. Check the temperature, air movement and signs of dampness at different times of the day especially in the spring and fall. Rapid environmental changes cause the greatest stress. If pigs are going to be moved from a temperature controlled building to an open front finishing unit. It may be a good idea to pre-condition the pigs by dropping the temperature a few degrees a day for a week or so before moving them. (Holis, 1996).

Hyun et al. (1998) proved the main effect of various stressors (high temperature, high stocking and mixing) after four week exposure on average daily gain (ADG) and average daily feed intake (ADFI). The stress of high temperature, high stocking density and mixing depressed 4-week ADG by 12 %, 16 % and 10%+ and ADFI by 7 %, % and % respectively.

The cost of feed continues to be the major part of the cost of producing pork. The metabolizable energy in the feed is precious; at it is energy directly useful to a pig (Curtis, 1996).

Negative environmental influences on voluntary feed intake by pigs has to do which the well-known feed-intake-lowering effects of high effective environmental temperature that occur as the homoeothermic pigs attempt to establish thermal equilibrium with their environment (The National Research Council, 1981,2000; Curtis, 1983, 2000). Voluntary feed intake is positively correlated with growth rate and negatively correlated with lean composition of growth, but not with feed-conversion efficiency (gain: feed ratio) (Forbes, 1995).

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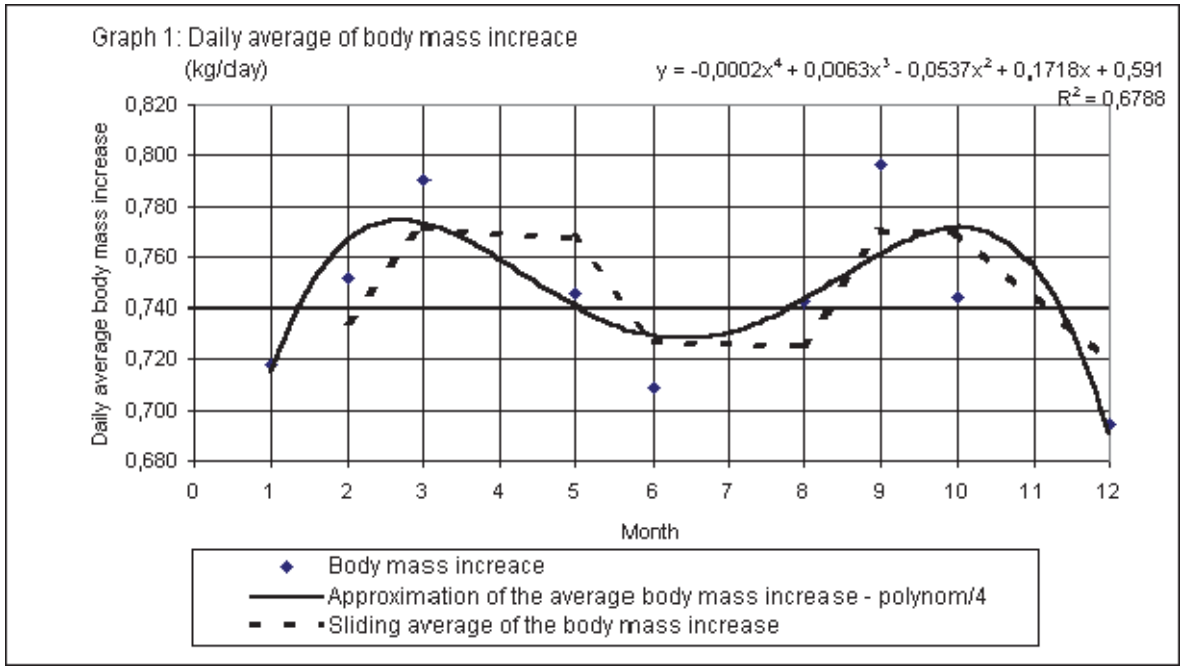
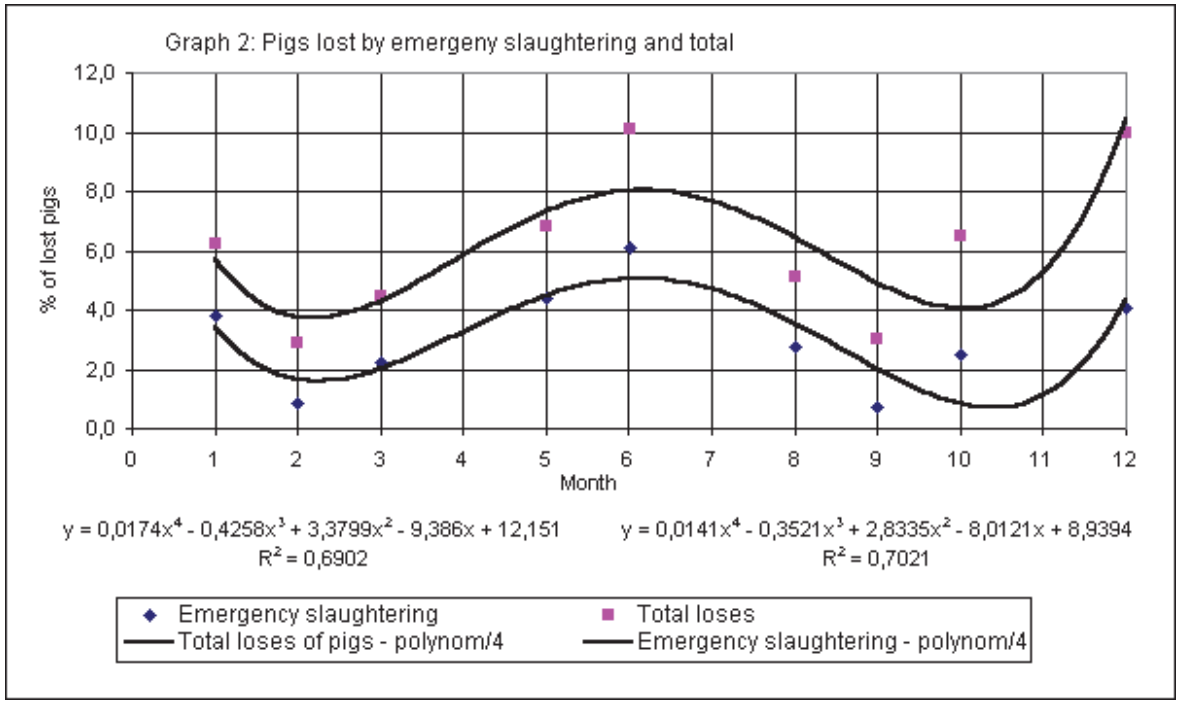
Table 1. *The influence of macroclimatic condition on selected parameters during the fattening of pigs*

		Month of the year								
The begin of fattening	month	1	2	3	5	6	8	9	10	12
Total body mass increase	kg	78,3	84,2	81,4	82	78	81,7	83,6	76,6	77,1
Fattening time	days	109	112	103	110	110	110	105	103	111
Body mass increase	kg/day	0,718	0,752	0,790	0,745	0,709	0,743	0,796	0,744	0,695
Feed conversion	kg/kg	3,29	2,93	3,01	3,07	3,17	3,14	2,95	3,25	3,35
Daily feed consumption	kg/day/item	2,36	2,35	2,38	2,29	2,25	2,33	2,35	2,42	2,33
Emergency slaughtering	items	10	7	7	11	18	9	10	16	31
Emergency slaughtering	%	3,8	0,9	2,2	4,4	6,1	2,8	0,7	2,5	4,0
Total loses	items	16	3	7	20	28	11	3	10	21
Total loses	%	6,2	2,9	4,5	6,8	10,1	5,1	3,0	6,5	10,0


Graph 1: Daily average of body mass increace
(kg/day)
y = -0,0002x⁴ + 0,0063x³ - 0,0537x² + 0,1718x + 0,591
R² = 0,6788
Daily average body mass increase
0,820
0,800
0,780
0,760
0,740
0,720
0,700
0,680
0 1 2 3 4 5 6 7 8 9 10 11 12
Month
Body mass increace
Approximation of the average body mass increase - polynom/4
Sliding average of the body mass increase


Graph 2: Pigs lost by emergeny slaughtering and total
% of lost pigs
12,0
10,0
8,0
6,0
4,0
2,0
0,0
0 1 2 3 4 5 6 7 8 9 10 11 12
Month
y = 0,0174x⁴ - 0,4258x³ + 3,3799x² - 9,386x + 12,151
R² = 0,6902
y = 0,0141x⁴ - 0,3521x³ + 2,8335x² - 8,0121x + 8,9394
R² = 0,7021
Emergency slaughtering
Total loses
Total loses of pigs - polynom/4
Emergency slaughtering - polynom/4