

## RESEARCH ON THE INFLUENCE OF DENSITY FROM PEN ON GROWTH PARAMETERS RECORDED AT PIGS THAT ARE USED FOR THE PRODUCTION OF BACON

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### Abstract

The purpose of this study was to establish the influence of density from pen on the production performance registered in a pig breeding unit for bacon. The biological material consisted of xYorkshire Landrace x Duroc triracial Metis (LYD) divided into two batches: L1 - 21 animals per pen and L2 - 26 animals per pen. The following parameters were observed: the dynamics of weight gain, average daily gain, feed consumption during growth and fattening period, the feed conversion index and the actual losses and their causes. The dynamics of the body weight shows a superiority of the batch: L1 (99, 4 kg) to batch L2 (97.8 kg), which represents a difference of 1.63%. Also in the case of other studied parameters (the average daily weight gain, feed consumption, feed conversion) the batch that was formed from 21 specimens/pen (L1) registered high performances in comparison with batch L2 (26 specimens/pen). The results that were obtained confirm the fact that the density of the pens influences the productive performances of the pigs. On the basis of the data we recommend that the pigs are kept in effectives of 20-21 specimens per pen in order to obtain better productive and economic results.

**Key words:** pigs, density, body weight, feed consumption

### INTRODUCTION

Lining up with the European standards of carcass quality imposes pig breeders from Romania to approach a new perspective in what numeric breeding of the swine effective and the improvement of the genetic potential of the swine is concerned, these being essential aspects for the improvement of the prolificacy and of the meet production.

The animal's density in the compartment influences the degree of feed value. Therefore, the food is valued much well when the animals are put in individual pens. The higher the density of animals in pens the lower the degree of food value.

### MATERIAL AND METHODS

The researches were on triracial specimens that resulted from the crossing of Landrace x Yorkshire x Duroc breeds, according with the protocol from the breeding unit.

The Metis that resulted from crossing Landrace, Yorkshire and Duroc breeds, on which were made observations concerning the influence of the technology of maintenance of the productive performances, were of 235 specimens, being divided in 2 experimental batches, 5 pens for each batch (table 1).

The body weight during the breeding period was determined within S.C. C&C Bluhm Pedersen farm, in the compartments where the experiments were developed by weighing them on the electric scale, in the first day and on decades depending on the switching to another category, until the age when they are delivered at the slaughterhouse.

In the same conditions the weighing of the combined feed quantity consumed by each experimental batch for each recipe of used feed.

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Table 1 Experiment's Organization

Batch	Number of specimens per batch (head)	Number of pigs per pen (head)	Number of pens per batch	Economic destination
L 1	105	21	5	Slaughterhouse
L 2	130	26	5	Slaughterhouse

## RESULTS AND DISCUSSIONS

### 1. Dynamics of body weight

The determination of the body weight was done by individual weighing of the animals when they enter the experiment (30

days), when they exit the nursery (80 days), at the end of the growing period (120 days) and at the end of the fattening period (155 days). The values that were obtained at this indicator are presented in table 2.

Table 2 Average body weight at Metis LYD

Batch	No. Of specimens per pen (head)	Average weight (kg) at the age of:			
		30 days	80 days	120 days	155 days
L 1	21	7.5± 5.94	31.7± 5.46	58.9± 5.52	99.4± 6.92
L 2	26	7.4± 3.83	30.7± 4.93	57.7± 4.85	97.8± 6.37
Fisher Test		n.s.	s.	s.	s.

From the data presented in table 2 we notice that the homogeneity of the pens, at the beginning of the experiment, was pretty good, between the two experimental batches being registered a slight difference of 100 g in favour of batch L1. The variability of the specimens was small, the differences between the batches being insignificant.

The first differences that are a little bigger appear at the end of the nursery period (80 days) when the pigs from batch L1 register an average weight of 31.7 kg in comparison with the pigs from batch L2 where it was registered an average weight of 30.7 kg.

The studied character was less homogenous, the calculated value for the coefficient of variation indicates a medium variability and the Fisher test indicates the significant differences between the two batches.

At the end of the growing period (120 days) the difference of weight between the batches is maintained or it is raised in favour of batch L1 (1.2 kg). Therefore the average weight from batch L1 was of 58.9 kg and the one from batch L2 of 57.7 kg, between the two batches being registered significant differences.

The delivery age of the pigs to the slaughterhouse was very good being of 155 days, under the European average which is between 160 – 170 days, for this specie. The average weight of the body has different values for the two batches, at batch L1 being of 99.4 kg and at batch L2 being of 97.8 kg,

between the batches being a difference of approximately 1.60 %.

In what the homogeneity of the studied character is concerned, with the exception of the weights from the first day and from 30 days of life when the variability was small, we observed that the calculated values for V% were the ones specific of a big variability.

### 2. Results concerning average daily weight gain (SMZ)

The average daily weight gain represents the most important coefficient of economic efficiency in what pig breeding and fattening is concerned. In other word, the economic efficiency of a farm depends, mostly, on the type of animal feed.

During the entire experimental period, the average daily weight was different during the growing period and different in what the experimental batches are concerned (table 3).

The growing speed, stated by the average daily weight gain, has registered a slight difference from one batch to another. Therefore, the average daily weight gain during the nursery period (30-80 days) had the biggest values at Metis LYD grouped in batch L1 (484 g) and a small value for the products from lo L2 (466 g). The results from batch L2 that were not so good are because of the big number of animals from pens, the group hierarchy being established not as easy as batch L1.

Table 3 Results concerning the average daily weight gain at Metis LYD during the growing and the fattening period

Batch	No. of specimens per pen (head)	The average daily weight (g) gain at the age of :			
		30 – 80 days	80 - 120 days	120 - 155 days	SMZ during the breeding period
L 1	18	484± 5.70	680± 7.41	1157± 8.11	735± 6.14
L 2	22	466± 6.19	675± 6.33	1145± 7.68	723± 6.35
Fisher Test		s	s	s	s

During 80-120 days the bigger gains of weight were registered at batch L1 (680 g) the difference in what batch L2 is concerned being of 5 g (0.7%).

In the last period of growing - fattening (120 – 155 days) the biggest average daily weight was registered at batch L1 (1157 g), the difference from batch L2 (1145 g) being of + 1% (12 g).

The average daily weight gain is calculated for all the growth – fattening period, the results being in the same line as the previous presentation, at batch L1 being registered the biggest value of 735 g than the value of 723 g at batch L2.

The calculated values for the variation coefficient indicates an average variability

(10 – 20%) and the Fisher test indicates significant differences between the two batches at all the experimental periods.

### 3. Results concerning feed conversion

The efficiency of feed usage was established on account of the data concerning the feed consumption and of the weight gain, being expressed in kg of combined feed for each kg of weight gain.

In table 4 there are presented the feed quantities consumed by the two Metis LYD batches as well as the conversion coefficient of the feed that was made during the period of growth and fattening.

Table 4 Average feed consumption and the consumption coefficient at the Metis LYD batches that were studied (Kg/specimen)

Specification	The age of the descendants (days)						TOTAL (1 – 155 days)		Fisher Test
	30-80		80-120		120-155		L1	L2	
	L1	L2	L1	L2	L1	L2			
Consumed feed (kg)	46.3	46.6	72.8	73.6	125.0	128.0	244.1	248.2	s
Weight gain (kg)	24.2	23.3	27.2	27.0	40.5	40.1	91.9	90.4	s
Consumption coefficient (kg)	1.91	2.0	2.67	2.72	3.08	3.19	2.65	2.74	s

At the batch L1 the feed ingestion from the nursing period (30 - 80 days) was of 46.3 kg, in the growing period (80 - 120 days) was of 72.8 kg and in the fattening period (120 - 155 days) was of 125 kg, resulting a total consumption of 244.1 kg.

At batch L2 the feed consumption was bigger than in L1. Therefore, in the nursing period was of 46.6 kg, in the growing period was of 73.6 kg and in the weight gaining period was of 128 kg, obtaining a total consumption of 248.2 kg.

The consumption coefficient (kg of consumed feed/kg of weight gain) being correlated with the average daily of feed

consumption and the weight gaining, is very close with the two analyzed batches.

The consumption coefficient during the nursing period at batch L1 was of 1, 91 kg and 2 kg at batch L2, during the growing period at batch L1 was of 2.67 kg and of 2.72 kg at batch L2 and in the weight gaining period in batch L1 was of 3.08 and of 3.19 kg at batch L2, resulting a consumption coefficient for the whole life at batch L1 of 2, 65 kg and of 2.47 at batch L2.

After the calculation of Fisher test, between the experimental batches were registered significant statistics differences at all the coefficients that were analyzed (consumed feed, weight gain, consumption coefficient).

#### 4. Pig loss and its causes

The causes of pig loss are multiple but the most often ones are pathological or are influenced by the microclimate, by the

accommodation's condition and mostly they depend on a defective management.

The mortality registered during the experimental period at the two Metis batches is presented in table 5.

Table 5 The mortality registered at Metis LYD

Batch	Number of specimens per batch (head)	Mortality registered during: (Head.)		
		nursing	growing	Weight gaining
L 1	105	2	0	0
L 2	130	3	1	0

The total loss from the effective were up to 2 specimens al batch L1 (1.90%) and up to 4 specimens at batch L2 (3.07%) value that is in the normal limits of this coefficient.

The most significant loss was at both experimental batches during the nursing period. The causes that determined these losses were because of the fights from the pen for establishing the hierarchy of the group, another cause being some diseases that appeared within the population, digestive problems like: diarrhea and lawsonia intracellularis (bacteria, infectious agent, intracellular bacteria which produces intestinal hyperplasia).

#### CONCLUSIONS

1. The values that were registered for the body weight, from the two lots of pigs, indicates a superior difference in favour of batch L1 (21 heads per pen) than batch L2 (26 heads per pen) of approximately 1.7% during all the analyzed period, being in accordance with the data presented by the speciality literature;

2. The data that was registered at the daily average weight gain at the two batches, also, indicates a superior difference on the entire period of growing and weight gaining of the batch L1 (756 g) than batch L2 (753 g) of approximately 11 g (1.8%);

3. The consumption coefficient (kg of combined feed/weight gain kg) registered during the entire experimental period was of 2.52 kg at batch L1 and 2.61 kg at batch L2 values that in the best results presented by the speciality literature;

4. The pig loss, registered at both batches, was under 5% and can be the cause of the special quality of the genetic material used in

the experiment as well as the technology of exploitation from the growing and weight gaining period;

5. The results that were obtained confirm that the density from the pen influences the productive performances of the pigs. On account of the data from the experiment we recommend in maintenance of the pigs in effectives of 20-21 of specimens per pen for obtaining the best productive and economic results.

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