

Electronic Journal of Polish Agricultural Universities is the very first Polish scientific journal published exclusively on the Internet, founded on January 1, 1998 by the following agricultural universities and higher schools of agriculture: University of Technology and Agriculture of Bydgoszcz, Agricultural University of Cracow, Agricultural University of Lublin, Agricultural University of Poznań, Higher School of Agriculture and Teacher Training Siedlce, Agricultural University of Szczecin, and Agricultural University of Wrocław.



**ELECTRONIC
JOURNAL
OF POLISH
AGRICULTURAL
UNIVERSITIES**

**1998
Volume 1
Issue 1
Series
ANIMAL HUSBANDRY**

Copyright © Wydawnictwo Akademii Rolniczej we Wrocławiu, ISSN 1505-0297

GRUŻEWSKA A., BIESIADA-DRZAZGA B. 1998. THE INFLUENCE OF ENVIRONMENTAL AND GENETIC FACTORS ON THE RESULTS OF FATTENING OF BROILER CHICKENS *Electronic Journal of Polish Agricultural Universities*, Animal Husbandry, Volume 1, Issue 1.

Available Online <http://www.ejpau.media.pl>

THE INFLUENCE OF ENVIRONMENTAL AND GENETIC FACTORS ON THE RESULTS OF FATTENING OF BROILER CHICKENS

Agata Grużewska¹, Barbara Biesiada-Drzazga²

¹ *Department of Agricultural Experimenting*

² *Department of Poultry Breeding*

Agricultural and Pedagogical University, Siedlce, Poland

[ABSTRACT](#)

[INTRODUCTION](#)

[MATERIALS AND METHODS](#)

[RESULTS AND DISCUSSION](#)

[SUMMARY and CONCLUSIONS](#)

[REFERENCES](#)

ABSTRACT

In the experiment the results of fattening of broiler chickens of Starbro and Hybro N lines raised in 8 poultry houses of Poultry Farm in Chotycze were analysed.

A significant effect of the commodity line on the average final body weight of birds, number of days of fattening, weight gains during the period of fattening was ascertained. The significant differentiation of body

weight between broilers of both lines of breeding arised significantly in the period from 3rd to the 6th week of fattening to the advantage of Hybro N line and in 7th week to the advantage of Starbro line.

Key words: line of breeding, body weight, feed consumption

INTRODUCTION

The main aim of breeding of broiler chickens is to obtain in the shortest time birds of the possible greatest body weight, with the possible low feed consumption and relative low mortality.

In 1996 in our country were produced altogether 395 th tn of poultry, in it 290 th tn of broiler chickens [Węzyk, 1997]. Now Polish producers have great possibilities of choice of breeding material both domestic and imported from renowned foreign firms.

The present study opens the series devoted to the analysis of production and economic results of fattening of broiler chickens of different commodity lines in the two poultry farms located in Chotycze and Dobrzyniec belonging to the incorporated group S.A. Drosed with the seat in Siedlce.

MATERIALS AND METHODS

The experimental material were broilers of Starbro and Hybro N lines raised in 8 poultry houses of Poultry Farm in Chotycze. Investigations were carried out in the period from 3rd February 1995 to 25th September 1997. Altogether the results of fattening of 84 lots of Starbro broilers and 26 lots of Hybro N broilers were analysed. Each lot included on the average 17169 of placed nestlings. Weighings of randomly chosen birds were conducted at the end of each week of fattening.

In the statistical analysis, broiler type, poultry house, following lot in the poultry house and feed supplier were taken into account. The significance of differentiation caused by the 3 first of mentioned factors with reference to the final body weight of birds, feed consumption per 1 kg of weight gains and number of days of fattening were examined applying test F (Fisher's - Snedecor's) under the linearic model:

$$1) y_{ijl} = m + L_i + K_j + LK_{ij} + R_l + e_{ijl}$$

The influence of line of breeding and following week of fattening on body weight of broilers was investigated using twofactor analysis of variance by the model:

$$2) y_{ijl} = m + L_i + T_j + LT_{ij} + e_{ijl}$$

It was checked simultaneously if there existed the significant differentiation of body weight of broilers during the following weeks of fattening, feed consumption per 1 kg of body weight and the average final body weight of birds depending on feed supplier (with regard to commodity lines) by the model:

$$3) y_{ijl} = m + L_i + D_j + e_{ijl}$$

where:

m - average of population

L_i - effect of i commodity line

K_j - effect of j poultry house

LK_{ij} - effect of interaction of i line of breeding and j poultry house

R_l - effect of L lot

T_j - effect of j week of fattening

LT_{ij} - effect of interaction of i commodity line and j week of fattening

D_j - effect of J feed supplier

e_{ijl} - random error

For detailed comparison of averages the Turkey's test was used assuming an error risk amounted to 0,05.

In addition correlation coefficients between the average body weight of chickens at the end of fattening and feed consumption per 1 kg of body weight and number of days of fattening were estimated.

European Efficiency Index determining efficiency of fattening of broilers was also calculated:

$EER = (\text{body weight} * \text{vitality}) / (\text{feed consumption per 1 kg of gain} * \text{number of days of fattening})$ and the result was expressed in %.

RESULTS AND DISCUSSION

Obtained results showed that the average body weight of birds after the end of fattening and number of days of fattening significantly depended on the commodity line of broilers ([table 1](#)). Hybro N chickens in comparison with Starbro ones were characterized by the significantly smaller average final body weight, with the significantly shorter period of fattening. Body weight of Hybro N broilers was close to the results presented by Mazanowski (1997) and Sosnówka (1996), whereas it was a little lower from a norm of Euribrid firm (1997).

Table 1. Values of averages (\bar{X}) and standard deviations (s) for body weight of broilers at the end of fattening, number of days of fattening and feed consumption per 1 kg of gained body weight and value of EEI

Commodity line	Analysed traits						European Efficiency Index	
	Body weight at the end of fattening (kg)		Number of days of breeding		Feed consumption per 1 kg of body weight			Number of lots
	\bar{X}	s	\bar{X}	s	\bar{X}	s	EEI	
Starbro	1.98	0.13	45.81	2.66	1.86	0.77	84	219.41
Hybro N	1.83	0.09	43.28	1.89	2.09	0.10	26	193.97
NIR _{0,05}	0.067		1.32					

Lack of NIR_{0,05} value for given trait means lack of significant differences between the averages for the commodity lines.

Body weight of chickens during the whole period of fattening was significantly dependent on the commodity line and age of birds alike. The interaction of both these factors was also significant. The detailed comparison of the average body weight of broilers for the commodity lines during the following weeks of fattening (table 2) showed the differentiation of this trait to the advantage of Hydro N line to the 6th week of fattening. In the period from the 3rd to the 5th week inclusive this domination was significant, whereas at the end of 6th week reversion of this relation occurred with significant intensification at the end of the 7th week of fattening of birds. It can be assumed that significantly greatest body weight gained by Starbro broilers at the end of fattening was caused not only by the significantly longer period of breeding, all the more so as the average time of fattening for both lines was longer than 7 weeks. Broilers of Hydro N line from the 6th week were characterized by considerable decrease of gain rates in comparison with Starbro birds. It seems that Hydro N line is better adapted to the present demands of fattening mainly because of the reasonable reduction of fattening to 6th weeks.

Table 2. Values of averages \bar{X} and standard deviations (s) for body weight of broilers during the following weeks of fattening with regard to the commodity lines

Commodity line	Statistics	Week of breeding							for lines total
		1	2	3	4	5	6	7	
Starbro	\bar{X}	131.50	295.35	560.12 ^b	920.94 ^b	1358.49 ^b	1753.18	2001.74 ^a	972.69
	s	14.80	49.69	85.87	109.63	129.20	139.38	123.25	666.25
Hybro N	\bar{X}	131.52	302.76	596.24 ^a	981.59 ^a	1412.07 ^a	1750.71	1864.12 ^b	947.43
	s	13.86	35.77	52.67	71.33	109.78	71.80	85.38	627.57
NIR _{0.05} = 35.67									

The comparison concerns the averages for the commodity lines in the particular weeks of fattening. The averages marked by different letters are significantly different.

Significant influence of any of examined factors on the average feed consumption per 1 kg of body weight was not proved. The value of this trait for broilers of Starbro line was insignificantly lower in comparison with the results of Hybro N line. These values are almost the same or even lower in comparison with the results of other investigations or declarations of foreign producers of feed (Mazanowski, 1997; Instruction of Euribrid, 1997). Weżyk and Herbut (1996) comparing Starbro and Hybro N broilers obtained after 49-days period of fattening birds of body weight of 2140 g and 2200 g respectively with feed consumption per 1 kg of gain amounted to 2180 g and 2140 g. Obtained, more advantageous results of Hybro N line at the end of 7-weeks fattening can be probably explained by better conditions of breeding during the duration of the experiment (permanent control of environmental circumstances) in comparison with poultry houses of commodity farm. Broilers of Hybro N line can be more sensitive to disadvantageous environmental conditions especially during the final period of fattening. Significant influence of feed supplier on the analysed traits was not ascertained.

Values of EEI obtained in the experiment are close to the values published in the previously cited studies and the results of broilers of Starbro line exceeded the analogous results of Hybro line (contrary than in cited literature). Mazanowski (1996) published EEI values

amounted to 218.0 and 216.0 and Węzyk and oth. (1996) - 194.9 and 201.4 respectively for Starbro and Hybro N lines.

The calculated correlations appeared to be positive but insignificant. These results indicated on permanent increasing of feed requirement as growing of broilers. At the same time gaining of greatest body weight at the end of fattening is not correlated with the increase of feed consumption per gain unit. Also prolongation of fattening period does not change discussed proportion (feed consumption during the fattening period to body weight at the end of fattening).

SUMMARY and CONCLUSIONS

1. Starbro and Hybro N commodity lines are different in growth rate.
2. Broilers of Starbro line can be effectively fattening for 7th weeks whereas the period of fattening of Hybro N line should be reduced to 6th weeks.
3. Gaining of the greatest body weight at the end of fattening is not correlated with increased feed consumption per 1 kg of body weight regarding to both commodity lines.

REFERENCES

1. Instrukcja Euribrid (1997). Stada brojlerowskie. Hybro N.
2. Mazanowski A. (1997). Czynniki wpływające na efektywność odchowu kurcząt brojlerów. Polskie Drobiarstwo, 1:27.
3. Sosnówka E. (1996). Brawo brojlery. Polskie Drobiarstwo, 2:11.
4. Węzyk S., Herbut E. (1996). Dobra pasza z "Dobropaszu". Polskie Drobiarstwo, 9:30.
5. Węzyk S. (1997). Stan i perspektywy polskiego drobiarstwa w aspekcie integracji z Unią Europejską. Mat. Symp. Ferma Drobiu'97, Międz. Targi Drob., 10-12.04, Gdynia.

Submitted: 14.07.1998

Agata Grużewska
Department of Agricultural Experimenting
Barbara Biesiada-Drzazga
Department of Poultry Breeding
Agricultural and Pedagogical University
14 Prusa St.
08-110 Siedlce, Poland
tel. 6431247

[Responses](#) to this article, comments are invited and should be submitted within three months of the publication of the article. If accepted for publication, they will be published in the chapter headed 'Discussions' in each series and hyperlinked to the article.
