THE STUDY OF THE QUALITY OF EGG PRODUCTION IN THE GUINEA FOWL (NUMIDA MELEAGRIS) POPULATION FROM BIHOR COUNTY

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RESEARCH ARTICLE

Abstract

The paper presents research on the quality of hatching eggs of the guinea fowl species - Numida Meleagris. The researches carried out were carried out on a number of 252 specimens (40 males and 212 females) of the guinea fowl species -Numida meleagris coming from three private breeders from Oradea and from the territory of Bihor county. The quality of hatching eggs was assessed as being mediocre to good, even in the conditions where the egg shell became more and more friable towards the end of the reproduction period, as a result of the increase in their volume.

Keywords: incubation, eggs weight, dynamics, Grey Guinea fowl
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INTRODUCTION

The grey guinea fowl comes from the African continent, where it was domesticated in antiquity. Throughout history, the herds on the European continent were numerically reduced, a repopulation and a better spread of this species being made after 1500 AD. period in which, probably, the territory of Romania was also populated.

Guinea fowl populations are raised in the North-West areas of the country, especially for meat production, and egg production is used in addition.

It is not known exactly when the guinea fowl population was multiplied in the North-West area of the country, but it is known that the local population raises these birds, together with the palm-footed ones, to obtain traditional meat products with special organoleptic properties.

MATERIAL AND METHOD

Data from the presented work were collected from private farms as follows: 65 heads (10 males and 55 females) from the first farm, 99 heads (16 males and 83 females) from the second farm, 88 heads (14 males and 74 females) in the third breeder. The following tools and materials were used to carry out the research: digital analytical and technical balances, X-ray machines, computer equipped with spreadsheet software, depending on the experimental method approached.

All the obtained results were compared with the reference values from the specialized literature (Sauveur B., 1988; Usturoi M.G., 1999; Vacaru-Opriș I. et al., 2002).

The data obtained experimentally were centralized and processed statistically.

RESULTS AND DISCUSSIONS

The qualitative parameters of the hatching eggs were analyzed dynamically, starting from the onset of egg laying (29-33 weeks), successively passing through the egg-laying peak - 34-36 weeks, the egg-laying plateau - 37-50 weeks and ending with the end of egg-laying (65 weeks).

Regarding the average weight of the eggs, it changed, from the value of 43.9±0.5g, at the beginning of the laying, to the value of 46.6±0.8g, at its end (table 1).

Table 1

Dynamics of the incubation eggs weight (g), during laying period, in the studied Grey Guinea fowl population

Period to lay eggs	C1(n=25)		C3- (n=25)		C4(n=25)		Breeding average	
	$\bar{x} \pm s_{\bar{x}}$ (g)	V %	$\bar{x} \pm s_{\bar{x}}$ (g)	V %	$\bar{x} \pm s_{\bar{x}}$ (g)	V%	$\bar{x} \pm s_{\bar{x}}$ (g)	V%
Begynning (29 weeks)	43,2 ±0,5	6,2	44,8 ±0,3	9,3	43,7 ±0,7	11,7	43,9 ±0,5	10,2
Peak (35 weeks)	44,1 ±0,4	9,7	45,3 ±0,3	5,4	44,9 ±0,6	6,9	44,8 ±0,4	7,1
Platou (43 weeks)	45,4 ±0,7	8,1	46,1 ±0,5	6,9	45,8 ±0,5	5,4	45,8 ±0,6	6,2
End (65 weeks)	46,3 ±0,9	9,3	46,9 ±0,8	8,2	46,5 ±0,8	9,8	46,6 ±0,8	9,3

The average thickness of the mineral shell evolved inversely proportionally, in relation to the weight of the eggs, decreasing from the value of 0.500±0.008 mm, to the value of 0.470±0.005 mm, at the end of laying. The coefficient of variation had values in the range of 12.8-17.1% (table 2).

The egg format index underwent changes during the productive period, oscillating between the limits of 75.5% and 77.4% (population averages), with minor fluctuations compared to the specialist recommendations (75-76% Bălăşescu, 1980) (table 3 and fig.1)

Table 2.

Dynamics of the average shell thickness (mm) of the incubation eggs, across the laying period, in studied Grey Guinea Fow

Period to lay eggs	C1 (n=25)		C3 (n=25)		C4 (n=25)		Breeding average	
	$\bar{x} \pm s_{\bar{x}}$ (mm)	V%	$\bar{x} \pm s_{\bar{x}}$ (mm)	V%	$\bar{x} \pm s_{\bar{x}}$ (mm)	V%	$\bar{x} \pm s_{\bar{x}}$ (mm)	V%
Begynning (29 weeks)	0,510 ±0,007	11,4	0,490 ±0,007	14,1	0,500 ±0,009	12,8	0,500 ±0,008	12,8
Peak (35 weeks)	0,500 ±0,004	13,8	0,490 ±0,008	12,1	0,500 ±0,014	15,7	0,497 ±0,009	13,2
Platou (43 weeks)	0,490 ±0,011	12,7	0,480 ±0,010	15,7	0,490 ±0,007	13,8	0,487 ±0,010	13,8
End (65 weeks)	0,480 ±0,004	16,1	0,460 ±0,003	18,4	0,470 ±0,008	15,6	0,470 ±0,005	17,1

Table 3

Values of the shape index (%) of the incubation eggs, across the laying period, in studied Grey Guinea Fow

Period to lay eggs	C1(n=25)		C3 (n=25)		C4 (n=25)		Breeding average	
	$\bar{x} \pm s_{\bar{x}}$ (%)	V%	$\bar{x} \pm s_{\bar{x}}$ (%)	V%	$\bar{x} \pm s_{\bar{x}}$ (%)	V%	$\bar{x} \pm s_{\bar{x}}$ (%)	V%
Begynning (29 weeks)	75,00 ±1,7	12,4	76,00 ±0,7	7,9	75,51 ±1,1	9,5	75,5 ±1,2	18,3
Peak (35 weeks)	75,51 ±1,4	5,1	76,47 ±0,6	6,8	76,00 ±0,5	6,4	76,0 ±0,8	6,2
Platou (43 weeks)	76,00 ±0,7	8,7	76,92 ±1,1	8,1	76,47 ±1,8	8,5	76,5 ±1,2	8,4
End (65 weeks)	76,92 ±1,3	7,1	77,78 ±0,6	7,9	77,36 ±0,6	7,5	77,4 ±0,8	7,6

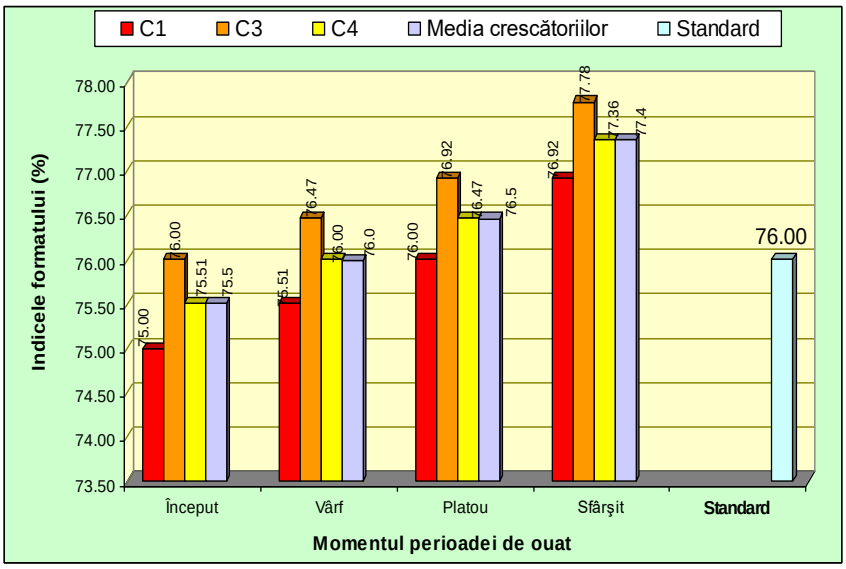

Figure 1. **Modification of the shape index during the laying period, in Grey Guinea fowl**

The Haugh index, which reproduces the quality of the egg most synthetically, had average values between 75.3 U.H. and 77.7 U.H., with the highest value at the beginning of laying (77.7 U.H.), a situation that confirms the quality of the eggs produced, which lend themselves successfully to incubation (standard: 75-82 U.H., Usturoi, 1999).

The homogeneity of the populations was considered very good to good for the format index (v%=7.6-18.3%), respectively good for the Haugh index (v%=11.1-12.3%) (table 4 and figure 2).

Table 4

Haugh index values (U.H.), across the laying period in Grey Guinea fowl studied populations

Period to lay eggs	C1(n=25)		C3 (n=25)		C4 (n=25)		Breed average	
	$\bar{x} \pm s_{\bar{x}}$ (U.H.)	V%	$\bar{x} \pm s_{\bar{x}}$ (U.H.)	V%	$\bar{x} \pm s_{\bar{x}}$ (U.H.)	V%	$\bar{x} \pm s_{\bar{x}}$ (U.H.)	V%
Begynning (29 weeks)	77,2 ±1,1	11,8	78,0 ±1,3	11,5	77,8 ±1,4	11,7	77,7 ±1,3	11,1
Peak (35 weeks)	76,1 ±1,8	13,9	76,3 ±1,6	11,3	75,8 ±1,7	12,4	76,1 ±1,6	12,3
Platou (43 weeks)	75,5 ±1,8	12,5	76,0 ±1,4	12,4	75,4 ±1,1	11,6	75,6 ±1,4	12,1
End (65 weeks)	75,2 ±1,3	11,8	75,7 ±0,9	11,1	75,1 ±1,5	10,3	75,3 ±1,2	11,2

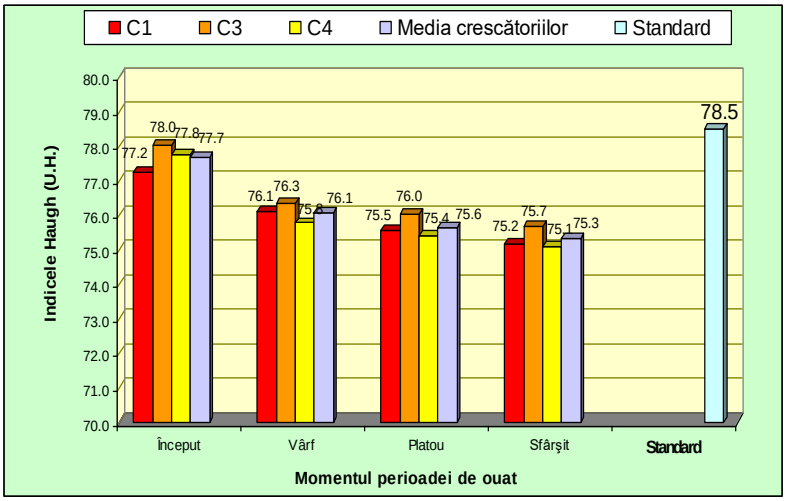

Figure 2. **Haugh index assessment in the eggs issued from the studied Grey Guinea fow**

CONCLUSIONS

At the present time, it is recommended to continue purebred breeding and, in the future, to practice crossing between better performing lines, possibly from French meat populations, to improve weight gain and feed conversion for this character.

Currently, selection indices adapted for each individual poultry line are used. They consider the individual performances of the parents, the existence and intensity of additive variances and covariances, the weight of the characters pursued in order to obtain the desired result in breeding. Private breeding poultry farms could enter the breeding pyramid, providing valuable individuals for precocity, growth speed, feed conversion efficiency in meat production (in males) and egg production. Also, those females that show high laying intensity and stability in egg production can be selected for reproduction.

The egg production was characterized by a laying intensity of 86.5% at the peak of laying, in these conditions obtaining an average annual production of 161.6 eggs/bird, the value being 5% lower than the standard recommendations (170 eggs per introduced female/year);

In the future, we want to diversify the genetic background of the Numida meleagris species, grown in Bihor county, by carrying out exchanges with breeders from other regions of the country or even abroad. It is desired to introduce a new color variety (pearl on a white background) into the already existing populations or to multiply the herds in the case of farms that already possess this guinea fowl variety (Dodu M. 2010).

REFERENCES

Bălăşescu, M., Bâltan, Gh., Dascălu, AL., Vancea, I., 1980, Avicultură. Ed. Didactică şi Pedagogică, Bucureşti

Dodgson, J.B., 2000, Integrating quantitative and molecular techniques in selection for diseses rezistence. XXI World's Poultry Congress, Montréal, Canada, Aug. 20-24.

Dodu, M., 2010, Contribuţii la indentificarea şi dezvoltarea fondului genetic aviar din judeţul Bihor.Teză de doctorat,USAMV Iaşi.

Driha, A., 2000, Curs de Tehnologia creşterii păsărilor. Editura Mirton, Timişoara.

Gîlcă, I., 1996, Aprecierea valorii de ameliorare a animalelor, Ed. Periscop, Iaşi

Grosu, H., Oltenacu, P.A., 2005, Programe de ameliorare genetică în zootehnie. Ed. Ceres, Bucureşti

Mallard, J., Donaire, M., 1990, Evaluation de la selection. C.R. Acad. Agric. Fr. 76, 6 81-91

Mărgărint, I., Boişteanu, P.C., Chelaru, A., 2002, Fiziologia animalelor domestice, Ed. Ion Ionescu de la Brad, Iaşi

Oroian, T.E., Vlaic, A., 2001, Ameliorarea genetică a populaţiilor de animale domestice,Ed. Academic Press, Cluj- Napoca

Popescu-Vifor, Şt., 1990, Genetică populaţiilor de animale domestice. Editura Ceres, Bucureşti.

Sandu, Gh., 1995, Modele experimentale în zootehnie, Ed. Coral-Sanivet, Bucureşti

Ţîrlea, S., 1995, Consideraţii privind producerea şi difuzarea materialului biologic avicol în Romania. Simpozionul Ştiinţific Naţional „Dezvoltarea zootehniei-o certitudine pentru viitor", Iaşi

Usturoi, M.G., 2008, Creşterea păsărilor. Editura Ion Ionescu de la Brad, Iaşi

Usturoi, M.G., 1999, Incubaţia la păsările domestice, Ed. Ion Ionescu de la Brad, Iaşi.

Usturoi, M.G., 2004, Producerea ouălor de consum, Ed. Ion Ionescu de la Brad, Iaşi.

Usturoi, M.G., Boişteanu, P.C., Vacaru – Opriş, I.,1999, Indici de calitate pentru ouăle de prepeliţă destinate incubaţiei artificiale. Simpozion Ştiinţific de Zootehnie cu participare internaţională, Iaşi 9-10 decembrie

Vacaru-Opriş, I., 1993, Tehnologia creşterii păsărilor. Vol I şi II. Lito, Universitatea Agronomică, Iaşi.

Vacaru-Opriş, I., 2000, 2007, Tratat de Avicultură. Vol I. Editura Ceres, Bucureşti.

Vacaru-Opriş, I., 2002, Tratat de Avicultură. Vol II. Editura Ceres, Bucureşti