ASPECTS OF EGG PRODUCTION AND LAYING INTENSITY FOR THE GEESE POPULATION*, (White Rhine Dutch geese)*, FROM BIHOR COUNTY

Dodu Monica*

*University of Oradea, Faculty of Environmental Protection, 26 Gen. Magheru St., 410048 Oradea; Romania, e-mail: monica_dodu@yahoo.com

Abstract

The paper presents partial results regarding the identification and characterization of some domestic poultry populations from Bihor County, for example Anseriformes, species Anser anser (domestic goose - White Rhine Dutch Breed). The experimental results and the case studies have been run in 3 farms of pure breed. There were analyzed a number of 110 geese (22 males and 88 females). Studies were made upon the following parameters: egg production and laying intensity, the quality of hatching eggs (egg weight, shell thickness, index format, Haugh index). The egg production per season averaged 41.4 eggs per head in January-July, due to the seasonal breeding of geese. Weight of resulted eggs has increased, as the birds approached the end of the laying season.

Keyword: White Dutch Rhine breeds, Eggs yield, lazing intensity, incubation eggs, shell thickness

INTRODUCTION

Although this species is characterized by a strong seasonality in egg production, people prefer this kind of species for other valuable productions, namely meat, down and fatty liver, consequently, suited for achieving the very best of traditional products, especially in the west part of the country.

The advantages resulting from the fact that these populations are suited for extensive livestock farming and the poultry exploiting very good some resources, that are inaccessible to other species (grassland, water surface).

MATERIAL AND METHODS

In the area of Bihor County, there were carried out studies in 3 private farms, owning this pure breed. There were analyzed a number of 110 individuals (22 males and 88 females). In farm C1 there were 35 geese (7 males and 28 females), in farm C2: 28 geese (6 males and 26 females) and finally in farm C3: 45 geese (9 males and 36 females).

The material used in the experiment consisted of birds of both sexes and different ages (hatching in the juvenile period, reaching sexual maturity, the active period of reproduction).

The quantifying of egg production was made by calculating the egg laying intensity and making the graphical representation for the curve of egg laying. They used the following method:

$$I.P. = \frac{Q \times 100}{N \times K}$$, where:

- I.P. = laying intensity, egg laying rate;
- Q = quantity of eggs produced by a bird in K days
- N = number of birds which record the entire egg production ("Q")

In order to determine the body weight, there was used the gravimetric method, making individual weighing with the analytical balance, made at the onset of laying, peak of lay, the plateau period and at the end of laying.

The thickness of mineral shell was determined by individual measurements with caliper, over portions of mineral shell collected from the round end, from the middle are and the pointed end of each egg to be studied.

In order to appreciate better the quality of hatching eggs, there were calculated two synthetic indexes which give relevant information regarding the morphological and internal quality of breeding eggs, namely: the index of egg format and Haugh index.

The analyzed eggs were compared with reference values from literature (Sauveur B., Usturoi M.G., 1999; Vacaru-Opriş I. şi col., 2002).

RESULTS AND DISCUSSION

Regarding the studied populations, the peak of laying was reached in the 5th week, i.e when the birds were 37 weeks of age (Table 1).

Table 1

Evolution of laying

Age (week)	C1 farm			C2farm			C3farm			Media populations mean		
	No. birds	Share/day (piece.)	I.P. (%)	No. birds	Share/day (piece.)	I.P. (%)	No. birds	Share/day (piece.)	I.P. (%)	No. birds	Share/day (piece.)	I.P. (%)
0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**16**	**17**	**18**
33	27	2,7	10,00	22	2,8	12,86	34	3,9	11,43	28	3,1	11,34
34	27	6,8	25,00	22	4,9	22,14	34	8,5	25,00	28	6,7	24,24
35	27	13,7	50,71	22	11,5	52,14	34	16,8	49,29	28	14,0	50,51
36	27	14,9	55,00	22	12,4	56,43	34	18,7	55,00	28	15,3	55,38
37	27	15,6	57,86	22	12,7	57,86	34	19,7	57,86	28	16,0	57,86
38	27	15,2	56,43	22	12,4	56,43	34	19,2	56,43	28	15,6	56,43
39	27	13,7	50,71	22	11,8	53,57	34	15,3	45,00	28	13,6	49,13
40	27	12,9	47,86	22	10,2	46,43	34	13,4	39,29	28	12,2	43,97
41	27	11,0	40,71	22	9,6	43,57	34	12,4	36,43	28	11,0	39,72
42	27	9,5	35,00	22	8,6	39,29	34	10,9	32,14	28	9,7	34,97
43	27	8,7	32,14	22	8,0	36,43	34	10,0	29,29	28	8,9	32,11
44	27	7,9	29,29	22	6,8	30,71	34	8,0	23,57	28	7,6	27,32
45	27	7,5	27,86	22	6,1	27,86	34	7,5	22,14	28	7,1	25,52
46	27	6,8	25,00	22	5,8	26,43	34	6,6	19,29	28	6,4	23,04
47	27	5,6	20,71	22	4,9	22,14	34	5,6	16,43	28	5,4	19,34
48	27	4,8	17,86	22	3,9	17,86	34	5,1	15,00	28	4,6	16,69
49	27	4,4	16,43	22	3,3	15,00	34	4,6	13,57	28	4,1	14,88
50	27	3,1	11,43	22	1,9	8,57	34	2,4	7,14	28	2,5	8,92
Total of eggs		**1152,90**			**963,60**			**1319,20**			**1145,23**	
Eggs/bird		42,7			43,8			38,8			41,4	

In the period of laying, laying intensity had a value of 11.4%, and reached the maximum value of 57.86%, then continuously decreased, until the birds have reached the age of 50 weeks (8.92%). The eggs production per season averaged 41.4 eggs /head. The best performance has been achieved by the birds from the population C2 (43.8 eggs / head). Still, these values are much lower than the standard values of breed (50-60 eggs per season), requiring the selection of numerous variants for the eggs production.

The quality of hatching eggs

The weight of resulted eggs increased, as the birds were reaching the end of laying season. From an average of 83.5 ± 1.4 g/egg, at the laying onset, it has reached the average value of 186.2 ± 2.1 g/egg, after the breeding season. Eggs with the highest weight were produces by birds from the population C1, which also presented the highest degree of precocity (Table 2).

Table 2

Dynamics of incubation eggs weight (g), during laying period in White Rhine Dutch geese

Laying moment	C1		C2		C3		Farm mean	
	$\bar{X} \pm S_{\bar{x}}$ (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%
Onset (33-34 wks)	185,8 ±1,7	10,4	183,9 ±1,1	10,8	180,7 ±1,2	11,2	183,5 ±1,4	10,9
Peak (37-38 wks)	186,2 ±2,1	11,3	184,5 ±1,3	11,7	181,4 ±1,5	11,1	184,0 ±1,8	11,4
Plateau (33-34 wks)	186,9 ±1,9	10,9	185,7 ±1,6	10,6	183,1 ±1,8	10,3	185,2 ±1,7	10,4
Ceasing (48-49 wks)	187,4 ±2,4	12,5	186,6 ±1,8	12,4	184,6 ±2,1	11,8	186,2 ±2,1	12,1

The thickness of mineral shell had between 0.558 ± 0.022 mm, in the onset of lay and 0.547 ± 0.014 mm at the end of breeding season (Table 3).

Table3

Dynamics of shell thickness (mm), during laying period in White

Dynamics of shell thickness (mm), during laying period in White Rhine Dutch geese

Laying moment	farm C1		farm C2		farm C3		Farm mean	
	$\bar{X} \pm S_{\bar{x}}$ (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%
Onset (33-34 wks)	0,551 ±0,017	10,5	0,557 ±0,023	10,1	0,566 ±0,027	10,7	0,558 ±0,022	10,4
Peak (37-38 wks)	0,547 ±0,013	11,2	0,554 ±0,019	9,3	0,563 ±0,024	10,4	0,555 ±0,018	10,3
Plateau(33-34wks)	0,543 ±0,011	10,9	0,551 ±0,015	10,4	0,560 ±0,022	11,1	0,551 ±0,017	10,8
Ceasing(48-49wks)	0,539 ±0,009	12,5	0,547 ±0,012	11,7	0,556 ±0,021	10,8	0,547 ±0,014	11,6

Egg format index had values ranging from 65.8 ± 1.1% (end of lay) - 67.2 ± 1.4% (peak of laying), fitting in the quality recommendations for the hatching eggs, at the studied species (Bessarabov, 1985, op. the Vacaru-Opris, 2002), presented in Table 4.

Haugh index recorded maximum value in the peak of lay (80.8 ± 1.2 UH). The best value for this synthetic indicator of egg quality was seen in the population of farm C2 (Table 5).

Table 4

Dynamics of eggs shape index (%), during laying period in White Rhine Dutch geese

Laying moment	Farm C1		farm C2		farm C3		Farm mean	
	$\bar{x} \pm s_{\bar{x}}$ (%)	V%	$\bar{x} \pm s_{\bar{x}}$ (%)	V%	$\bar{x} \pm s_{\bar{x}}$ (%)	V%	$\bar{x} \pm s_{\bar{x}}$ (%)	V%
Onset(33-34wks)	66,8 ±0,9	11,9	65,2 ±0,8	12,3	68,1 ±1,3	10,9	66,7 ±1,1	10,8
(Peak37-38wks)	67,1 ±1,2	12,3	65,9 ±1,3	11,8	68,7 ±1,7	11,1	67,2 ±1,4	11,7
Plateau(33-34wks)	66,3 ±1,4	8,7	65,4 ±1,2	9,2	67,8 ±0,9	10,1	66,5 ±1,2	9,4
Ceasing(48-49wks)	65,7 ±1,1	10,3	64,8 ±1,0	10,6	66,9 ±1,2	9,8	65,8 ±1,1	10,2

Table 5

Dynamics of Haugh index (U.H), during laying period in White Rhine Dutch geese

Laying moment	Farm C1		Farm C2		Farm C3		Farm mean	
	$\bar{x} \pm s_{\bar{x}}$ (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%
Onset (33-34 wks)	80,1 ±1,6	13,2	80,4 ±1,8	12,7	80,2 ±1,7	12,1	80,2 ±1,7	12,6
Peak (37-38 wks)	80,7 ±1,2	11,7	81,0 ±1,3	11,4	80,8 ±1,2	11,1	80,8 ±1,2	11,4
Plateau (33-34 wks)	79,2 ±0,8	9,6	79,4 ±0,9	9,4	79,1 ±1,0	10,2	79,2 ±0,9	9,8
Ceasing (48-49 wks)	77,7 ±1,1	11,2	77,8 ±1,1	10,3	77,4 ±1,2	10,9	77,7 ±1,1	10.7

CONCLUSIONS

Populations belonging to white Rhine Dutch breed, which is being studied in Bihor County, were characterized by a seasonal characteristic of geese reproductive, the average number of eggs produced / adult geese was of 41.4 in January-July.

The perspectives of breeding at the flocks of geese, in this area of the country are optimistic, because in the western part of Romania, there is a tradition for consuming meat and web-footed liver specialties.

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