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RESEARCH ON PERFORMANCES OF RAISING CERTIFICATE CHICKENS

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Abstract

The important demand for non-pollutant eco-agrifood products, with a reduced level of harmful influence on human health, requires increasing concern for the production, management and marketing of agricultural products (poultry included), obtained under ecological conditions.The research presented in this paper is also related to this context, both by settling the qualitative and quantitative features of eco-chickens and a likely decrease of production costs by varying the values of energy and protein within the mixed fodder structure used for these chickens.Our research was performed on 150 birds (Ross 308) at SDE Avicola Moara Domnească farm during a 56 days' period. The birds were distributed in three treatment groups according to three nutritive values of mixed fodder (CM, C1, C2). Following result processing, we found that the best weight gain was recorded in CM group (a daily average gain of 41.98 ± 0.91 g). The lowest value for the specific consumption was recorded in CM group (2.54 ± 0.16 kg, very significant differences between the groups) and the lowest viability was recorded in C1 group (10.40 ± 1.56 %).

Key words*: certificate, specific consumption, viability, weekly medium weight gain*

INTRODUCTION

Until 2014, the poultry meat production estimated average growth rate will be 2.2 per cent annually, owing to an increasing demand. Considering this point of view, the expectations for aviculture are quite good. Within this context, a development of the ecological aviculture subsector is also expected, since it is estimated that, until 2013, the market rate for ecological poultry meat should reach 4-5 per cent for all three categories: Certified, Bio and Free-range [1]. And yet, the production growth shall also lead to an increase of the costs paid by the breeders, including the need of a lower cost in order to economically compete on the global market (increasingly competitive nowadays), costs for poultry comfort and food security standards, costs for disease control and for the bio-security conditions [2, 4].

The authors of this research aim to analyse the qualitative and quantitative features of eco-broiler chickens and to find a way of production cost decrease by varying the values of energy and protein within the mixed fodder structure used for poultry [5].

MATERIAL AND METHOD

The experiment was organized at S.D.E. Avicola Moara Domnească farm, the bio-basis of the University of Agronomic Science and Veterinary Medicine of Bucharest, on certificate-broilers (Ross 308), distributed in three uniform experimental variants, according to individual body weight and sex ratio. The block experimental plan was used [6].

Raising was conducted according to the standard technology for certificate-poultry, under the same conditions: food and water available *ad libitum*.

Three treatments were performed on each experimental group, in order to determine the qualitative and quantitative features. All experiments were performed in the same period of time, on the same biological material and in the same unit, using 5 groups (10 birds each per treatment) - See Table 1.

The experimental chart was as follows:

- treatment I (CM): constant energetic level and constant protein level;
- treatment II (C1): variable protein level and constant energetic level;

- treatment III (C2): constant protein level and variable energetic level.

The experimental period was 56 days and used the biphasic feeding technology.

During the experiment, the following performance values were found and recorded weekly: live weight, feed consumption and viability [2, 3].

The weekly specific and cumulated consumption values were calculated using the data on average gain and mixed fodder consumption values.

Outputs due to mortality were daily recorded; thus, the mortality rate percentage could be calculated both weekly and for the entire growth period (cumulated).

The data obtained were recorded and statistically processed. The Multiple Student Test was used for interpreting the significance of differences between groups.

Table 1. Work schedule for Certificate type broilers

a)

Specification	U.M.	Phase		
		Rising		
		T_1	T_2	T_3
Time	days	28	28	28
Flock	birds	50	50	50
Pens	no.	5	5	5
ME	MJ/kg	100	100	93.92
Protein	%	100	95.36	100

b)

Specification	U.M.	Phase		
		Finishing		
		T_1	T_2	T_3
Time	days	28	28	28
Flock	birds	50	50	50
Pens	no.	5	5	5
ME	MJ/kg	100	100	93.06
Protein	%	100	95.30	100

RESULTS AND DISCUSSIONS

The weekly results obtained during the experiment for certificate-broiler production are shown in Tables no/no 2-5. Table 2 shows the weekly average body gain during the entire growth period (eight weeks).

It is notable that weight increased with age; the maximum difference between the experimental groups increased from 8.27 g (at the age of 1 week) between groups CM and C2, to 160.66 g between CM and C1, to 115.22 g between CM and C2 and to 45.44 g (at the age of 8 weeks) between groups C1 and C2.

However, differences decreased proportionally between the same groups, generally with age, from 6.4 per cent (at the age of one week) to approx. 4.8 per cent (age of eight weeks).

Obviously, the experimental variants had no statistic insurance for none of the possible ages for broiler marketing.

Table 2. Evolution of body weight in Certificate-Poultry (grams)

a)

Specification		Group	
		C M	
		X	S_X
Week	1	128.44	1.47
	2	300.94	4.04
	3	563.73	8.86
	4	902.31	17.15
	5	1269.37	25.97
	6	1667.11	35.03
	7	2029.21	45.14
	8	2384.86	56.09

b)

Specification		Group		Group	
		C1		C2	
		X	X	S_X	S_X
Week	1	124.13	1.42	120.17	1.48
	2	258.87	3.29	284.80	4.59
	3	442.21	7.77	537.46	10.32
	4	684.11	14.16	851.60	21.15
	5	1055.39	24.98	1206.20	34.69
	6	1472.90	38.65	1595.42	45.17
	7	1864.45	52.63	1936.11	65.84
	8	2224.20	69.88	2269.64	64.57

The dynamics of the weekly gain in certificate-poultry is shown in Table 3. According to calculations, the gain increased with age for all experimental groups, up to the age of six weeks. Poultry in CM - C2 groups had the average gain values very close to one another, up to the age of six weeks.

Table 3. Evolution of weekly gain in Certificate -Poultry (grams)

a)

Specification		Group	
		C M	
		X	S_X
Week	1	94.66	0.95
	2	172.49	2.93
	3	262.79	4.92
	4	338.58	8.41
	5	367.06	9.55
	6	397.74	11.38
	7	362.10	14.86
	8	355.65	15.95

b)

Specification		Group C1		Group C2	
		X	X	S_X	S_X
Week	1	89.33	1.24	85.97	1.50
	2	134.73	2.17	164.62	3.16
	3	183.34	4.78	252.66	5.74
	4	241.91	6.62	314.14	11.03
	5	371.28	10.89	354.60	14.48
	6	417.51	14.28	389.20	11.28
	7	391.55	14.03	340.70	20.66
	8	359.75	17.27	333.50	12.10

Starting from the age of one week and up to the age of four weeks, the C1 group (with variable protein) recorded lower values in comparison with the other variants; afterwards, the position in the result hierachy varied, exceeding the other groups between the five and eight weeks, ceasing the growth with small differences (7.8 per cent), statistically not assured.

Table 4 shows the evolution of the weekly feed consumption for certificate-poultry. As shown by the results, the consumption values in different experimental groups were quite similar – C1 group excepted, which at the age of seven weeks, had the mixed fodder consumption 4.40 per cent higher than CM and 4.15 per cent higher in comparison with C2, and also with the exception of C2, which, at the age of six weeks, consumed 3.9 - 5.4 per cent more than the other two groups. In the last growth week, consumption exceeded 1.1 kg and its values were quite similar, as the maximum differences between the group average were of 0.7 per cent.

Table 4. Evolution of weekly mixed fodder consumption in Certificate-Poultry (grams)

a)

Specification		Group C M	
		X	S_X
Week	1	151.80	1.28
	2	310.41	5.27
	3	525.58	9.84
	4	778.85	19.34
	5	917.74	23.88
	6	1073.78	30.73
	7	1087.30	44.58
	8	1138.24	51.03

b)

Specification		Group C1		Group C2	
		X	X	S_X	S_X
Week	1	147.03	1.14	155.41	0.93
	2	324.56	5.39	327.24	6.56
	3	458.85	11.95	530.55	12.05
	4	617.44	16.89	722.48	25.36
	5	890.99	26.14	957.32	39.10
	6	1089.11	37.27	1131.79	32.81
	7	1135.51	40.68	1090.23	66.12
	8	1129.53	54.23	1133.98	41.12

The weekly viability in certificate-poultry (see Table 5) was weak: an equal mortality rate (4 - 6 per cent) was recorded for all groups; later it occurred at odd intervals in different variants, C1 group excepted as it recorded serious loss (2.2 per cent) in the fourth week of the experiment.

Table 5. Evolution of mortality rate in Certificate-Poultry (percentage)

Specification		Group E M		Group E 1		Group E2	
		X	S_X	X	S_X	X	S_X
Week	1	4	1.26	6	0.77	4	0.77
	2	0	0	2,2	0.70	4.2	0.83
	3	0	0	0	0	0	0
	4	0	0	2,2	0.72	2	0.66
	5	2	0.64	0	0	0	0
	6	2	0.63	0	0	0	0
	7	0	0	0	0	0	0
	8	0	0	0	0	0	0

Final production performances for certificate poultry are shown in Table 6 and Figure 1.

Broilers type certificate reached an average live weight value ranging between 2224.20 g at C1 and 2384.86 g at CM; the protein or energetic variation had no influence over the results which showed no statistically assured differences.

The average daily growth gain varied similarly, the values ranging between 39.92 g at C1 and 41.98 g at CM. The specific consumption was most favourable in CM group with constant protein and energetic levels and least favourable in C2 with variable energetic level (2.54 - 2.70).

All differences between groups were statistically assured. Poultry viability was better in CM group (8.0 per cent mortality rate); the worst level was recorded in C1 (10.4 per cent mortality rate); however, differences between variants were not statistically assured.

As a conclusion, for the certificate-poultry, the best results were obtained in group CM, where the specific consumption was very significantly lower, in comparison with the other variants.

Table 6. Final production performances in Certificate-Poultry

a)

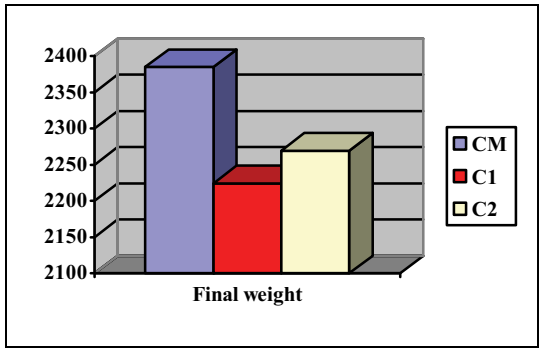
Specification	Units	Group C M	
		X	S_X
Live weight	g	2384.86	56.09
Student Test	-	CM-C1=1.266	
Daily average gain	g	41.98	0.91
Student Test	-	CM-C1=1.280	
Specific consumption	kg	2.54	0.16
Student Test	-	CM-C1=25.031	
Cummulated mortality rate	%	8.00	1.23
Student Test	-	CM-C1=0,283	

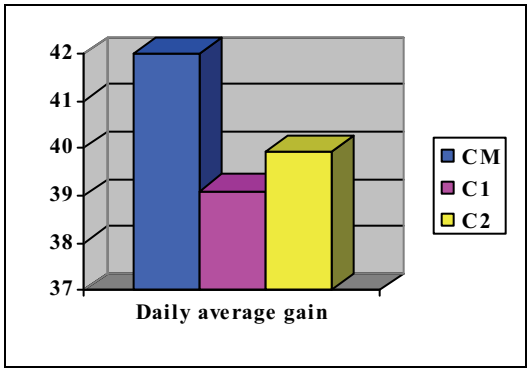
b)

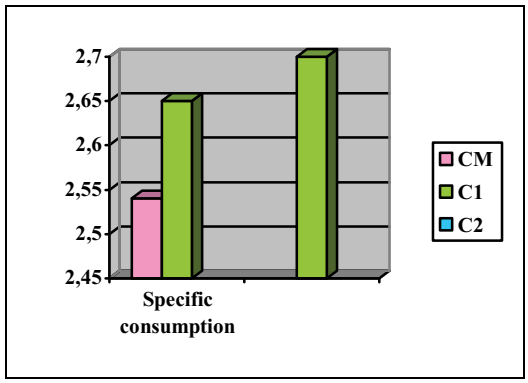
Specification	Units	Group C1	
		X	S_X
Live weight	g	2224.20	69.88
Student Test	-	C1-C2=0.336	
Daily average gain	g	39.11	1.24
Student Test	-	C1-C2=0.045	
Specific consumption	kg	2.65	0.01
Student Test	-	C1-C2=6.299	
Cummulated mortality rate	%	10.40	1.56
Student Test	-	C1-C2=0.024	

c)

Specification	Units	Group C2	
		X	S_X
Live weight	g	2269.60	64.57
Student Test	-	C2-CM=0.952	
Daily average gain	g	39.92	1.15
Student Test	-	C2-CM=1.282	
Specific consumption	kg	2.70	0.01
Student Test	-	C2-CM=22.161	
Cummulated mortality rate	%	10.20	1.11
Student Test	-	C2-CM=0.311	







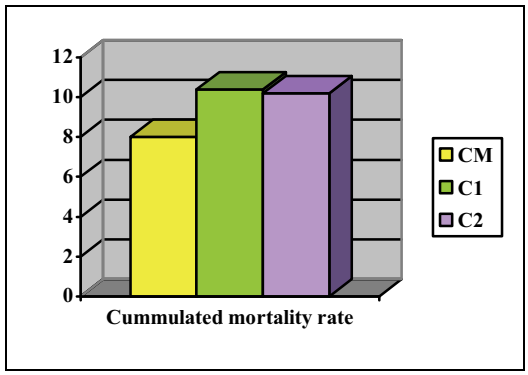


Fig. 1. Certificate poultry - final production performances

CONCLUSIONS

Following the experiment, the final performances recorded for the poultry type certificate are as follows:

- Live weight varied between 2224.20 ± 69.88 g, in C1 and 2384.86 ± 56.09 g, in CM;
- The average daily gain reached the highest level in the CM group (41.98 ± 0.91 g) and the lowest in the C1 group (39.11 ± 1.24);
- The specific consumption varied between 2.54 ± 0.16 in CM and 2.70 ± 0.01 in C2;
- The cumulated mortality rate ranged between 8.00 ± 1.23 percent in CM and 10.40 ± 1.56 percent in C1;
- In the specific consumption, there were distinctively significant differences (C1 - C2) and very significant (CM - C1 and CM - C2).

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