PERFORMANCES OF SOME HEN BROILERS IN CONDITIONS OF A SLOW GROWING APPLICATION IN EXTENSIVE SYSTEM AND WITH SLAUGHTERING AT DIFFERENT AGES

Carmen Irimia (Gavrilescu)[1], Paula Viorela Druc (Gafencu)[2], Roxana Nicoleta Raţu[2], Al. Usturoi[2], M.G. Usturoi[2*]

[1]SALSI S.A. – Sinaia, Romania
[2]Faculty of Animal Sciences, University of Agricultural Sciences and Veterinary Medicine of Iasi, Romania

Abstract

Research was carried out on three meat hen hybrids (one for industrial rearing: Ross-308 and two with slow growing: Hubbard and HB Color), reared in extensive system, in shelters opened to external paddocks. Speaking about growing rhythm, the best results were obtained at Ross-308 chickens (mean gain of 39.11-41.82 g/head/day), higher with 2.05-21.43% than at HB Color and with 1.62-16.14% than at Hubbard, with the mention that at growing series till 56 days Hubbard chickens overcome the Ross-308 ones with 0.5%. The final weight was 2.25-3.28 kg at Ross-308, higher with 0.44-12.19% than at Hubbard and with 2.75-21.64% face to HC Color. The best total fodder consumption was also at Ross-308 (5257-7319 g m.f./period), and the most inconvenient one was at HB Color (5439-7945 g m.f./period). Conversely, Ross-308 chickens had the highest mortality rate (9.04-12.021%), higher with 6.71-8.11% than Hubbard and with 2.69-4.29% than HB Color. Our conclusion was that only Hubbard hybrid realised production parameters close to the ones mentioned in rearing guide, and optimal slaughtering age of chickens with slow growing is 63 days.

Key words: broiler, hen, rearing, extensive, performances

INTRODUCTION

In the context of demographic explosion at world level, animals' rearing reach new dimensions, due to importance of animal origin products in human nourishment [2, 6]; indisputable also birds' rearing will achieve new valences focused, obvious, on durable development [1, 15].

Innovation in production of bird meat is considered durable if technological and social modifications aimed to environment protection (environment preservation, reducing of impact on environment and protection of natural environment), but also assure the economical sustainability (sustain the economical increasing) and social (improvement of life quality and jobs quality) [3].

Permanently, at regional or world level had debates about health state of nations and food chain, such as, for example, the liaison between obesity and fast-food networking [4, 7].

More over, consumers have adopted in the last period a healthy life style, and bird meat is considered a dietetic product, so were recorded increasing of selling for this food products category [5].

Also, modern society is more and more preoccupied by rearing, feeding, transport and slaughtering way of animals [11].

Progresses in modern production for bird meat, such as increasing of productive performances of hybrids as well as mechanization of rearing and slaughtering processes, provoke concerns regarding welfare assured to birds [12].

These types of concerns include aspects regarding birds' density in shelters, type and quality of administrated fodders, mortality rate, apparition of diseases at skeletal system, heart and lungs or injuries and bruises, efficiency of stunning before slaughtering etc [9, 16].

*Corresponding author: umg@uaiasi.ro
The manuscript was received: 21.09.2018
Accepted for publication: 02.05.2019

European Union introduced various regulations which allow elimination and/or improvement of such problems, but those ones involves financial investments with repercussions on selling price [13, 14].

Also, are promoted new alternative strategies for bird meat production, inclusively the one of "ecological" birds [10], birds feed only with cereals or birds reared in free range system [8, 14].

From the above mentioned reasons, by the effectuated research we aimed to establish the influence of biological material type and slow exploitation technology applied in spaces opened to external paddocks on performances of hen broiler.

MATERIAL AND METHOD

Biological material was represented by three genetic types of hen broiler, from which one for industrial rearing (Ross-308) and two with slow growing (Hubbard and HB Color).

During growing of studied chickens were tracked a series of indicators, which were appreciated in according with the utilised methods in avian research:

- corporal weight-weightings were weekly effectuated, in the same day and at the same hour (after 4-6 hours from foddering), in batch (50 birds) at ages of 1, 7 and 14 days and respectively, individually, starting with age of 21 days.
- weight gain-difference between chickens' weight at the beginning of period and the one from the end of period, is reported at periods' days number.
- exits from flock-daily losses are cumulated on each chickens' life week and it is reported to initial number for that week.
- fodder consumption-was calculated daily mean consumption (g/head/day) and conversion index (g m.f./kg body).

RESULTS AND DISCUSSIONS

Tests were realised into a farm at which the design of shelters include also the external paddock where birds had continuous access during daytime, through openings with a length of 2 m/50 m^2 shelter area; paddocks had vegetation and resting canopies for birds.

1) Results obtained for chickens slaughtered at age of 56 days

For research were constituted three experimental batches, as follows:

- batch Lc-1: 5000 Ross-308 chickens;
- batch Lexp-1: 16000 Hubbard chickens;
- batch Lexp-2: 16000 HB Color chickens.

Corporal weight. Must be mentioned that Ross-308 hybrid (created for increased performances at industrial rearing) was hardly to managed after the age of 28 days when was introduced a weak energetic recipe, while chickens with slow growing (Hubbard and HB Color) performed close to standard curves, but under control hybrid.

On age stages, Hubbard chickens realized only 60.0-99.6%, and the HB Color ones only 56.8-95.6% from mean weights of Ross-308 chickens (tab. 1).

Table 1 Evolution of corporal weight at chickens slaughtered at age of 56 days

Age (days)	Experimental batch:					
	Lc-1 (Ross-308)		Lexp-1 (Hubbard)		Lexp-2 (HB Color)	
	Corporal weight (kg)	%	Corporal weight (kg)	% from Lc-1	Corporal weight (kg)	% from Lc-1
1	0.06	100	0.04	66.7	0.04	66.7
7	0.20	100	0.12	60.0	0.13	65.0
14	0.50	100	0.34	68.0	0.30	60.0
21	0.88	100	0.58	65.9	0.50	56.8
28	1.30	100	0.85	65.4	0.88	67.7
35	1.50	100	1.23	82.0	1.20	80.0
42	1.80	100	1.68	93.3	1.50	83.3
49	2.05	100	1.95	95.1	1.83	89.3
56	2.25	100	2.24	99.6	2.15	95.6

Weight gain. From the obtained data resulted that Ross-308 chickens (Lc-1) had, per total period (1-56 days), a growing rhythm of 39.11 g/head/day, Hubbard chickens (Lexp-1) 39.29 g/head/day, and HB Color chickens (Lexp-2) of only 37.68 g/head/day.

Comparing the obtained data for daily mean gain show that Hubbard chickens overcome at the end chickens from control batch (Ross-308) with 0.5%, while HB Color chickens were situated under control with 3.7%. On age stages, chickens from batch Lexp-1 (Hubbard) realised 57.2-190.0% from growing mean gain of Ross-308 chickens, and the ones from batch Lexp-2 (HB Color) 52.6-159.9% (tab. 2).

Table 2 Weight gain for chickens slaughtered at age of 56 days

Period (days)	Experimental batch:					
	Lc-1 (Ross-308)		Lexp-1 (Hubbard)		Lexp-2 (HB Color)	
	Mean gain (g/head/day)	%	Mean gain (g/head/day)	% from Lc-1	Mean gain (g/head/day)	% from Lc-1
1-7	20.00	100	11.43	57.2	12.86	64.3
8-14	42.85	100	31.43	73.3	24.28	56.7
15-21	54.28	100	34.29	64.0	28.57	52.6
22-28	60.00	100	38.57	63.2	54.28	90.5
29-35	28.57	100	54.29	190.0	45.71	159.9
36-42	42.86	100	64.29	150.0	42.86	100.0
43-49	35.71	100	38.57	108.0	47.14	132.0
50-56	28.57	100	41.43	145.0	45.71	159.9
Mean	**39.11**	**100**	**39.29**	**100.5**	**37.68**	**96.30**

Differences between batches are due to hybrids' typology (HB Color have an evident rusticity), as well as on the utilised fodder.

Exits from flock. Chickens were achieved disease-free and were vaccinated in according with Romanian legislation for the applied rearing technology (anti avian pseudo pest, anti avian infectious bursitis, anti avian infectious bronchitis).

During experiment, chickens with a slow growing recorded a lower mortality rate than industrial chicken, respectively, 2.33% at Hubbard hybrid (Lexp-1) and 4.75% at HB Color hybrid (Lexp-2), face to 9.04% as it was at Ross-308 hybrid (Lc-1) (tab. 3).

Table 3 Exits of flock at chickens slaughtered at age of 56 days

Period (days)	Experimental batch:					
	Lc-1 (Ross-308)		Lexp-1 (Hubbard)		Lexp-2 (HB Color)	
	heads	%	heads	%	heads	%
1-7	63	1.27	91	0.56	89	0.55
8-14	51	1.04	54	0.30	231	1.45
15-21	65	1.24	40	0.24	125	0.79
22-28	64	1.23	40	0.24	71	0.45
29-35	72	1.44	40	0.25	76	0.49
36-42	49	1.00	37	0.25	60	0.39
43-49	47	0.97	40	0.26	47	0.23
50-56	41	0.85	32	0.23	61	0.40
Total	**452**	**9.04**	**374**	**2.33**	**760**	**4.75**

The main causes for exists of flock were nonviable chickens, yolk sacculitis and vitelline peritonitis, respiratory diseases and coccidiosis; in addition, at Ross-308 chickens were frequent affections of members, ascites, vascular and cardiac accidents, as well as the acute death syndrome.

Consumption of mixed fodders. Weekly fodder consumption realised by Ross-308 chickens (Lc-1) was 40-168 g m.f./head/day, with a mean on the whole period of 93.87 g m.f./head/day, at Hubbard chickens (Lexp-1) weekly consumption was 29-190 g m.f./head/day, with a mean of 106.25 g

m.f./head/day, and at HB Color (Lexp-2) consumption on life weeks was 20-177 g m.f./head/day, and the mean one for the whole period was e 97.12 g m.f./head/day.

Total consumption of mixed fodders recorded during control period (56 days) was 5257 g m.f./head at Ross-308 chickens, 5980 g m.f./head at Hubbard chickens and 5439 g m.f./head HB Color ones (tab. 4).

Table 4 Fodder consumption for chickens slaughtered at age of 56 days

Period (days)	Experimental batch:					
	Lc-1 (Ross-308)		Lexp-1 (Hubbard)		Lexp-2 (HB Color)	
	Daily mean (g/head/day)	Cumulated (g)	Daily mean (g/head/day)	Cumulated (g)	Daily mean (g/head/day)	Cumulated (g)
1-7	40	280	29	203	20	140
8-14	54	658	41	490	33	371
15-21	72	1162	61	917	42	665
22-28	60	1582	104	1645	90	1295
29-35	95	2247	158	2751	115	2100
36-42	121	3094	190	4081	144	3108
43-49	141	4081	118	4907	156	4200
50-56	168	5257	149	5980	177	5439
Mean	**93.87**	**-**	**106.25**	**-**	**97.12**	**-**

2) Results obtained for chickens slaughtered at age of 63 days

For this experience was continued the study on the same hybrids being constituted three experimental batches, as follows:

- batch Lc-2: 5300 Ross-308 chickens;
- batch Lexp-3: 16700 Hubbard chickens;
- batch Lexp-4: 6745 HB Color chickens.

Corporal weight. At population, weight of Ross-308 chickens was 60 g, and the one of Hubbard and HB Color chickens was 40 g.

Further evolution of corporal weight was, naturally, an increasing one, so at the end of growing series (age of 63 days), corporal weight was 2.55 kg for chickens from batch Lc-2 (Ross-308), 2.49 kg for the ones from batch Lexp-3 (Hubbard) and 2.48 kg for chickens from batch Lexp-4 (HB Color).

Comparing, on ages stages, corporal weight of hybrids with slow growing with the one of chickens for industrial rearing (Ross-308) resulted that Hubbard chickens (Lexp-3) realised 65.9-108.4% from weights of chickens from control batch (Lc-2), and HB Color chickens (Lexp-4) realised 65.2-115.7% (tab. 5).

Table 5 Evolution of corporal weight at chickens slaughtered at age of 63 days

Age (days)	Experimental batch:					
	Lc-2 (Ross-308)		Lexp-3 (Hubbard)		Lexp-4 (HB Color)	
	Corporal weight (kg)	%	Corporal weight (kg)	% from Lc-2	Corporal weight (kg)	% from Lc-2
1	0.06	100	0.04	66.7	0.04	66.7
7	0.18	100	0.12	66.7	0.13	72.2
14	0.46	100	0.35	76.1	0.30	65.2
21	0.88	100	0.58	65.9	0.72	81.8
28	1.08	100	0.86	79.6	1.25	115.7
35	1.30	100	1.25	96.2	1.43	110.0
42	1.55	100	1.68	108.4	1.60	103.2
49	1.85	100	1.96	105.9	1.95	105.4
56	2.20	100	2.24	101.8	2.25	102.3
63	2.55	100	2.49	97.6	2.48	97.3

Weight gain. For chickens from batch Lc-2 (Ross-308) resulted a mean value per whole period of 39.52 g/head/day, with limits between 17.1 g/head/day (first life week) and 60.0 g/head/day (third life week).

At batch Lexp-3 (Hubbard), daily mean gain on whole period was 38.88 g/head/day (with limits of 11.4-61.4 g/head/day), and at batch Lexp-4 (HB Color) was 38.71 g/head/day (with limits of 12.8-75.7 g/head/day).

Hubbard chickens realised only 98.38% from daily mean gain of Ross-308 chickens (with limits of 66.7-177.4%), and HB Color chickens only 97.95% from performance of control batch (with limits of 60.7-264.7%) (tab. 6).

Table 6 Weight gain for chickens slaughtered at age of 63 days

Period (days)	Experimental batch:					
	Lc-2 (Ross-308)		Lexp-3 (Hubbard)		Lexp-4 (HB Color)	
	Mean gain (g/head/day)	%	Mean gain (g/head/day)	% from Lc-2	Mean gain (g/head/day)	% from Lc-2
1-7	17.1	100	11.4	66.7	12.8	74.8
8-14	40.0	100	32.8	82.0	24.3	60.7
15-21	60.0	100	32.9	54.8	60.0	100.0
22-28	28.6	100	40.0	139.9	75.7	264.7
29-35	31.4	100	55.7	177.4	25.7	81.8
36-42	35.7	100	61.4	172.0	24.3	68.1
43-49	42.9	100	40.0	93.2	50.0	116.6
50-56	50.0	100	40.0	80.0	42.8	85.6
57-63	50.0	100	35.7	71.4	32.8	65.6
Mean	**39.52**	**100**	**38.88**	**98.38**	**38.71**	**97.95**

Exists of flock. In case of batch Lc-2 (Ross-308 chickens), the number of mortalities in those 63 days of growing was 599 heads, which represented 11.30% from populating number. At chickens from batch Lexp-3 (Hubbard), losses totalised a number of 579 heads, respectively, only 3.47% from the initial number, and at batch Lexp-4 (HB Color) were lost 581 individuals, representing 8.61% from populating number (tab. 7).

Table 7 Exits of flock at chickens slaughtered at age of 63 days

Period (days)	Experimental batch:					
	Lc-2 (Ross-308)		Lexp-3 (Hubbard)		Lexp-4 (HB Color)	
	heads	%	heads	%	heads	%
1-7	53	1.00	89	0.53	55	0.82
8-14	60	1.24	67	0.41	71	1.18
15-21	64	1.50	122	0.77	66	0.97
22-28	68	1.32	86	0.43	75	1.09
29-35	74	1.37	60	0.39	74	1.08
36-42	85	1.45	46	0.26	75	1.07
43-49	66	1.28	40	0.26	66	0.92
50-56	75	1.25	38	0.24	55	0.83
57-63	54	0.89	31	0.18	44	0.65
Total	**599**	**11.30**	**579**	**3.47**	**581**	**8.61**

Causes of exits from flock were similar with the ones from previous series.

Consumption of mixed fodders. Mean fodder consumption realised by Ross-308 chickens (batch Lc-2) on whole period was 87.11 g/head/day, with weekly limits of 33-159 g/head/day; total fodder consumption was 5488 g mixed fodder.

At Hubbard chickens (Lexp-3), weekly consumption was 26-131 g/head/day, with a mean on the whole period of 88.78 g/head/day; cumulated consumption of mixed fodders being 5593 g.

Chickens belonging to HB Color hybrid (Lexp-4) consumed on whole period a quantity of 5987 g mixed fodders, which represented a daily mean consumption of 93.44 g/head/day, with weekly limits of 30-145 g/head/day (tab. 8).

Table 8 Fodder consumption for chickens slaughtered at age of 63 days

Period (days)	Experimental batch:					
	Lc-2 (Ross-308)		Lexp-3 (Hubbard)		Lexp-4 (HB Color)	
	Daily mean (g/head/day)	Cumulated (g)	Daily mean (g/head/day)	Cumulated (g)	Daily mean (g/head/day)	Cumulated (g)
1-7	33	231	26	182	30	210
8-14	70	721	42	476	33	441
15-21	88	1.337	66	938	91	1.078
22-28	59	1.750	98	1.624	114	1.876
29-35	77	2.289	101	2.331	100	2.576
36-42	90	2.919	102	3.045	100	3.376
43-49	81	3.486	109	3.808	145	4.391
50-56	158	4.592	124	4.676	129	5.194
57-63	128	5.488	131	5.593	99	5.887
Mean	**87.11**	**-**	**88.78**	**-**	**93.44**	**-**

3) Results obtained for chickens slaughtered at age of 81 days

For this series of experiences were formed 3 experimental batches, as follows:

- batch Lc-3: 5700 Ross-308 chickens;
- batch Lexp-5:
- 20060 Hubbard chickens;
- batch Lexp-6: 8679 HB Color chickens

Corporal weight. Ross-308 chickens (Lc-3), even if had a good start, recorded corporal weights under standard, especially till the end of growing period; chickens with slow growing (Hubbard and HB Color) were more difficult to manage under the aspect of corporal weight, being obtained performances under the specific guide for each hybrid.

Edificatory are the differences for corporal weights recorded at slaughtering age (81 days), when Hubbard chickens had a means weight lower with 12.2%, and the HB Color ones with 21.7% than Ross-308 chickens.

On growing stages, chickens from batch Lexp-5 (Hubbard) realised only 63.1-98.1% from mean weights of chickens from batch Lc-3 (Ross-308); at chickens from batch Lexp-6 (HB Color), differences were even higher, those ones realising only 57.9-93.0% from weight of Ross-308 hybrid (tab. 9).

Table 9 Evolution of corporal weight at chickens slaughtered at age of 81 days

Age (days)	Experimental batch:					
	Lc-3 (Ross-308)		Lexp-5 (Hubbard)		Lexp-6 (HB Color)	
	Corporal weight (kg)	%	Corporal weight (kg)	% from Lc-3	Corporal weight (kg)	% from Lc-3
1	0.06	100	0.04	66.7	0.04	66.7
7	0.19	100	0.12	63.1	0.11	57.9
14	0.48	100	0.39	81.3	0.29	60.4
21	0.91	100	0.57	62.6	0.53	58.2
28	1.15	100	0.78	67.8	0.80	69.6
35	1.23	100	1.00	81.3	0.99	80.5
42	1.40	100	1.29	92.1	1.25	89.3
49	1.58	100	1.55	98.1	1.47	93.0
56	1.98	100	1.87	94.4	1.65	83.3
63	2.40	100	2.15	89.6	1.97	82.1
70	2.86	100	2.49	87.1	2.21	77.3
81	3.28	100	2.88	87.8	2.57	78.3

Weight gain. Hubbard chickens (batch Lexp-5) overtake Ross-308 hybrid in life weeks 5, 6 and 7, when had gains higher with 44.46-174.98%, in rest of period being under the performance of control batch.

Also HB Color chickens (batch Lexp-6) overtake control hybrid (Ross-308) in life weeks 4, 5, 6 and 7, when were realised weight gains higher with 12.48-137.44%.

Growing velocity for Ross-308 chickens was lower only after they had access to external paddocks, but after that they succeeded a quickly return to the normal line.

Regarding the values for mean weight gain on the whole studied period (81 days), those ones were 41.82 g/head/day at hybrid Ross-308 (Lc-3), 35.07 g/head/day at hybrid Hubbard (83.86% from control's performance) and 32.86 g/head/day at HB Color (only 78.57% from the gain realised by Ross-308 chickens) (tab. 10).

Table 10 Weight gain for chickens slaughtered at age of 81 days

Period (days)	Experimental batch:					
	Lc-3 (Ross-308)		Lexp-5 (Hubbard)		Lexp-6 (HB Color)	
	Mean gain (g/head/day	%	Mean gain (g/head/day	% from Lc-3	Mean gain (g/head/day	% from Lc-3
1-7	18.57	100	11.43	61.6	10.01	53.90
8-14	41.43	100	38.57	93.10	25.71	62.06
15-21	61.43	100	25.71	41.85	34.28	55.80
22-28	34.29	100	30.00	87.49	38.57	112.48
29-35	11.43	100	31.43	274.98	27.14	237.44
36-42	24.28	100	41.43	170.63	37.14	152.96
43-49	25.71	100	37.14	144.46	31.43	122.25
50-56	57.14	100	45.71	79.99	25.71	44.49
57-63	60.00	100	40.00	66.67	45.71	76.18
64-70	65.71	100	48.57	73.92	34.28	52.17
71-81	60.02	100	35.73	59.53	51.43	85.67
Mean	**41.82**	**100**	**35.07**	**83.86**	**32.86**	**78.57**

Exists of flock. The highest mortality rate, 12.21%, was at hybrid Ross-308 (Lc-3), with limits between 0.36-2.99%/week. At HB Color chickens (Lexp-6) was the lowest mortality of only 4.1% (0.23-0.59%/week), and at Hubbard chickens (Lexp-5) was 9.13% (0.43-1.62%/week (tab. 11)).

Table 11 Exits of flock at chickens slaughtered at age of 81 days

Period (days)	Experimental batch:					
	Lc-3 (Ross-308)		Lexp-5 (Hubbard)		Lexp-6 (HB Color)	
	heads	%	heads	%	heads	%
1-7	59	1.04	72	0.36	63	0.73
8-14	52	0.92	61	0.31	54	0.62
15-21	22	0.36	54	0.23	45	0.43
22-28	63	1.14	97	0.41	88	1.05
29-35	29	0.41	62	0.30	52	0.54
36-42	28	0.40	69	0.33	60	0.58
43-49	26	0.37	67	0.32	62	0.59
50-56	72	1.28	62	0.30	67	0.71
57-63	83	1.34	72	0.39	78	0.79
64-70	105	1.96	102	0.56	102	1.47
71-81	157	2.99	104	0.59	121	1.62
Total	**696**	**12.21**	**822**	**4.1**	**792**	**9.13**

Mortality was due to the same causes as at previous series, with the mention that were observed injuries of follicles of the feathers from pectoral region, which affect the chest quality at slaughtering.

Consumption of mixed fodders. Regarding daily mean consumption established for each life week of chickens, the obtained data show levels of 22-173 g m.f./head/day at hybrid Ross-308 (batch Lc-3), 26-159 g m.f./head/day at hybrid Hubbard (batch Lexp-5) and 27-150 g m.f./head/day at hybrid HB Color (batch Lexp-6).

Daily mean consumption established for the whole studied period (81 days) was 90.36 g m.f./head/day at Ross-308, 92.55 g

m.f./head/day at Hubbard and 98.09 g m.f./head/day at HB Color.

Total fodder consumption realised by the studied hen hybrids was of only 7.319 kg at batch Lc-3 (Ross-308), face to 7.496 kg as it was at batch Lexp-5 (Hubbard) and 7.945 kg at batch Lexp-6 (HB Color) (tab. 12).

Table 12 Fodder consumption for chickens slaughtered at age of 81 days

Period (days)	Experimental batch:					
	Lc-3 (Ross-308)		Lexp-5 (Hubbard)		Lexp-6 (HB Color)	
	Daily mean (g/head/day)	Cumulated (g)	Daily mean (g/head/day)	Cumulated (g)	Daily mean (g/head/day)	Cumulated (g)
1-7	22	154	26	182	27	189
8-14	55	539	57	581	52	553
15-21	65	994	50	931	69	1036
22-28	47	1323	57	1330	67	1505
29-35	61	1750	75	1855	74	2023
36-42	73	2261	95	2520	103	2744
43-49	87	2870	101	3227	109	3507
50-56	114	3668	117	4046	141	4494
57-63	136	4630	136	4998	150	5544
64-70	161	5757	145	6013	150	6594
71-81	173	7319	159	7496	137	7945
Mean	**90.36**	**-**	**92.55**	**-**	**98.08**	**-**

CONCLUSIONS

From obtained data regarding the influence of genetic type and rearing system on performances of hen broiler resulted a series of aspects as follows.

The best corporal weights at the end of those three growing series were at Ross-308 (2.25 kg-slaughtering at 56 days; 2.55 kg-slaughtering at 63 days; 3.28 kg- slaughtering at 81 days), and the weakest ones at hybrid HB Color (2.15 kg; 2.48 kg; 2.57 kg).

This aspect was correlated with daily mean gain realised by studied chickens and which was 39.11-41.82 g/head/day at hybrid Ross-308, 35.07-39.29 g/head/day at hybrid Hubbard and 32.86-38.71 g/head/day at hybrid HB Color.

Rate of exits from flock was lower at hybrids with slow growing, due to their more pronounced rusticity (2.33-4.10% at Hubbard and 4.75-9.13% at HB Color) and higher at Ross-308 industrial type hybrid (9.04-12.21%).

Mean fodder consumption on whole period was 87.11-93.87 g/head/day at hybrid Ross-308, 88.78-106.25 g/head/day at hybrid Hubbard and 93.44-98.09 g/head/day at hybrid HB Color.

Total consumptions of mixed fodders were 5257-7319 g/period at Ross-308, 5593-7496 g/period at Hubbard and 5439-7945 g/period at HB Color, which leaded to realization of a feed conversion index of 2.152-2.336 kg m.f./head/kg gain, 2.246-2.669 kg m.f./head/kg gain and respectively, 2.373-3.091 kg m.f./head/kg gain.

The conclusion of our study was that for slow growing, Hubbard hybrid realise closer performances to the ones from rearing guide, even if was situated under the performances of Ross-308.

From those three tested growing periods, better results were obtained at series with slaughtering at an age of 63 days.

REFERENCES

[1] Beaumont C. et al., 2004-*Productivite et qualite poulet de chair*. INRA Prod. Anim., no. 17, pg. 265-273.

[2] Berri C., Le Bihan-Duval E., Baeza E., Chartrin P., Picgirard L., Jehal N., Quentin M., Picard M. and Duclos M.J., 2005-*Further processing characteristics of breast and leg meat from fast-, medium- and slow-growing commercial chickens.* Animal Research, no. 54, pg. 123–134.

[3] Castellini C., Berri C., Le Bihan-Duval E. and Martino G., 2008-*Qualitative attributes and consumer perception of organic and free-range poultry meat.* World's Poultry Science Journal, no. 64, pg. 500–512.

[4] De'bora Cristina, Varela Arruda A. and Goncalves A., 2017-*Quality characteristics of*

broiler chicken meat from free-range and industrial poultry system for the consumers. Journal Food Science Technology, no. 54, pg. 1818-1826.
[5] Dou T.C., Shi S.R., Sun H.J. and Wang K.H., 2009a-*Growth rate, carcass traits and meat quality of slow-growing chicken grown according to three raising systems.* Animals Science, no. 27, pg. 361–369.
[6] Evans T., 2015-*Global Poultry Trends, Poultry Expands its Share of World Meat Uptake.* The Poultry Site.
[7] Evans T., 2016-*The Americas is the largest chicken meat producing region in the world, but the industry there has grown more slowly than in other regions in recent years.* The Poultry Site.
[8] Fanatico A.C., Pillai P.B., Cavitt L., Owens C. and Emmert J.L., 2005b-*Evaluation of slower growing broiler genotypes grown with and without outdoor access: growth performance and carcass yield.* Poultry Science, no. 84, pg. 1321–1327.
[9] Farmer L.J., Perry G.C., Lewis P.D., Nute G.R., Piggott J.R., and Patterson R.L.S., 1997-*Responses of two genotypes of chicken to the diets and stocking densities of conventional UK and Label Rouge production systems – II. Sensory Attributes.* Meat Science, no. 47, pg. 77-93.
[10] Husak R.L., Sebranek J.G. and Bregendahl K., 2008-*A survey of commercially available broilers marketed as organic, free-range, and conventional broilers for cooked meat yields, meat composition, and relative value.* Poultry Science, no. 87, pg. 2367–2376.
[11] Jahejo A.R., Rajput N., Rajput N.M. and Mohammad Z.P., 2016-*Effects of heat stress on the performance of Hubbard broiler chicken.* Animal and Therapeutics, vol. 2 (1), pg. 1-5.
[12] Lawlor J.B., Sheehan E.M., Delahunty C.M., Kerry J.P. and Morrissey P.A., 2003-*Sensory characteristics and consumer preference for cooked chicken breasts from organic, corn-fed, free-range and conventionally reared animals*. International Journal Poultry Science, no. 2, pg. 409-416.
[13] N'dri Lydie, Sellier Nadine, Tixier-Boichard Michèle, Grasteau Sandrine, 2007-*Genotype by environment interactions in relation to growth traits in slow growing chickens.* Genetics Selection Evolution, no. 39(5), pg. 513-528.
[14] Tasoniero Giulia, Cullere M., Baldan Gabriele and Dalle Zotte Antonella, 2017-*Productive performances and carcase quality of male and female Italian Padovana and Polverara slow-growing chicken breeds.* Italian Journal of Animal Science, DOI: 10.1080/1828051X.2017.1364611
[15] Usturoi M.G., 2008-*Creşterea păsărilor*. Editura Ion Ionescu de la Brad, Iaşi.
[16] Youssef A., Abd-Elhamid E., Mustafa M., Muhammad M., 2017-*Response of slow-growing chickens to feed restriction and effects on growth performance, blood constituents and immune markers.* Revista Mexicana de Ciencias Pecuarias, no. 8(2), pg. 175-184.