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Growth and Life Strength Characteristics of Rock Partridges (A. Graeca) in Intensive Conditions

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Abstract: This study was made in order to determine the growth and life strength characteristics of rock partridges (A. Graeca) in intensive breeding conditions. The study was initiated with 354 chicks, which hatched recently and proceeded with 317 chicks after 4th week when chicks were separated into groups within the cage and on the ground 182 chicks were placed in the ground system (1098 cm^2/partridge) while 135 chicks were placed in the cage system (1060 cm^2/partridge) in order to determine the effects of intensive breeding methods on growth and life strength characteristics. Chick growing feed was used until 16th week to feed the partridges and then egg-laying chicken feed was used in order to feed the female partridges. Feeding was made ad libitum during the study. While no significant difference could be observed between the average animal weights in ground and cage groups until 11.week, the differences in 11, 12, 14 and 15 weeks ($p<0.05$) and 13. week ($p<0.01$) were considered to be significant. In the 16th week of breeding, the weights were measured as 435.76 g and 445.61 g, respectively, which show a significant difference between ground and cage groups ($p<0.05$). In weeks 20, 23, 27 and 32, the average weights of the female rock partridges in ground groups were significantly more than the weights of the female rock partridges in the cage groups ($p<0.01$). In ground and cage groups, life strength values were 63.73 and 92.59%, respectively between week 4 and week 16, which shows a significant difference ($p<0.01$). It was observed that, in intensive conditions, breeding in cage might be better than breeding on the ground, in means of animal weight increase and life strength values.

Key words: Rock partridge, intensive breeding, growth, life strength

INTRODUCTION

It was proved that, domesticated wild animals that live under human control are more effective than their wild ancestors, regarding their products and services. Among wild animals, humans try to breed animals that are hunted in controlled conditions because their meats are delicious and they are more effective. Partridges and pheasants are most prevalent among these[1-4].

Partridges that are produced in the coverts of Turkey are rock partridges (A. Graeca) that are easier to grow and also their meat are more delicious than hennaed[5-7]. Many studies have been made in order to increase the fertility of rock partridges[8-13].

Animal weight increase: Growth rate in animals depends on factors such as type, sex, age, feed amount and feed quality[1,9,14].

Cetin and colleagues[15] determined the average hatch weight of hennaed partridges as 13.74 g; and 58.21, 161.25, 272.36, 383.86 and 431.32 g in weeks 4, 8, 12, 16 and 20, respectively. In another study, the same researchers determined the average hatch weight of rock partridges as 15.31 g and 421.57 g in week 12[9].

Hermes and colleagues[11] determined the average weight intervals of male and female rock partridges that were fed in various rations, as 147-153, 332-356, 452-593 and 595-630 g in weeks 4, 8, 16 and 20, respectively.

Gentonson and colleagues[6] measured the average weights of male partridges as 463.8, 499.2 and 523.3 g and female partridges as 407.6, 416.5 and 436.0 g in weeks of 14, 16 and 20, respectively.

Kirikci and colleagues[12] measured the average weights of rock partridge chicks in different accommodation and illumination conditions as 93.08, 236.14, 363.72, 418.95 and 468.00 g in weeks 4, 8, 12, 16 and 20, respectively.

Life strength: Life strength is expressed as the ratio of survivors in a herd, to the initial animal quantity in a pre-determined period[16-18]. It is affected by factors such as egg weight in the incubator, incubation conditions, temperature changes after the incubation, genotype, sex, composition of the ration and illumination[19-23].

Woodard and colleagues[23] determined the life strength of rock partridges as 89% at the end of first 12 months and 81% at the end of 36 months.

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Cerit and Altinel[15] examined 1527 materials from hatch to 6 week of age in order to determine the life strength of Japanese quails and found the life strength ratios as 91.94, 86.90, 82.65, 79.24, 76.88 and 75.90% in weeks 1, 2, 3, 4, 5 and 6, respectively.

Aldag and Odabasioglu, in a study where they examined the life strength of quails in Japanese, French and German genotypes during 6 weeks, determined the life strengths in 6 th week as 96.78, 100.00 and 100.00%, respectively.

Studies should be made to increase in produktion in our country where quail breeding becomes more prevalent day by day.

The main purpose of this study was to determine the effects of breeding systems in intensive conditions, on the development performances of the rock partridges. Besides, it aimed to determine whether ground or cage breeding systems were more effective in order to obtain growth and life strength results that would supplement the local literature about partridge breeding.

MATERIALS AND METHODS

Animal materials: In the study, 354 rock partridge chicks at the age of 1 day were used. The study was made in University of Firat, Veterinary Faculty, of Animal Science Department and University of Firat, Veterinary Faculty, Education-Research and Application Farm.

The chicks that were kept together in the incubator in the first 3 weeks, were separated into 2 groups (ground and cage) after week 4.

After week 16, only female partridges were separated in to two groups (ground and cage) and their growth was examined until week 32.

Feed materials: Chick growing feed was used until 16th week to feed the partridges and then egg-laying chicken feed was used in order to feed the female partridges. The nutrition values of the feeds were presented in (Table 1). The Animal Feeding and Disease Department at University of Firat Veterinary Faculty made the feed analysis.

Method: The hatch weights of chicks that were 1 day of age were measured and foot numerators classified them. Then, they were placed in the incubator machine and kept together for 3 weeks. Automatic troughs provided unlimited clean drinking water for them. Vitamins and medicament were added regularly to their water against coccidiosis, Feeding was made ad libitum.

After week 4, chicks were taken to University of Firat, Veterinary Faculty, Education-Research and Application Farm, they were separated into ground and cage groups and their growths was examined.

In the ground system, 182 rock partridges were placed in a room with dimensions of 500x400x300 cm (width, length, height) with sawdust on the base. 1098 cm^2 area was calculated per animal, which corresponds to 9.1 partridges/m^2. In order to make it similar to natural environment, pebbles, shrubs were placed as well as sand in 2 bathtubs with dimension of 1x1 m for the animals to make sand bathing. In addition, sufficient mangers with 6 troughs with 5-liter capacity were placed. Weekly animal weights were determined individually and feeding made ad libitum.

In the cage system, 135 rock partridges were placed into 14 cages with dimensions of 100x100x50 cm with a base platform 15 cm below of each level. 1060 cm^2 area was calculated per animal, which corresponds to 9.6 partridges/m^2. Mangers were located in front of the cage while troughs were located at the backside. Feeding, base platform cleaning and data recording were made every morning regularly, determining of animal weights were made individually and feeing was made ad libitum.

After week 16, 80 female rock partridges continued to grow in ground and 79 rock partridges continued growing in the cages. Animal weight increases were measured by weighing them in weeks 20, 23, 27 and 32.

During the study, dying animals were recorded daily in order to determine the life strength.

Data analysis: 1 g sensitive electronic scale was used in order to measure the hatch weights and weekly weight increases of rock partridge chicks.

SPSS 11.0 package program was used for evaluating the collected data. The difference between the groups regarding the differences between the animal weights was calculated by Independent Samples t test and the significance control of the difference between the groups regarding life strength values was calculated by Chi Square Test (X^2)[24,25].

RESULTS

Animal weight increase: The rock partridges that were kept together in the first 3 weeks, were separated into 2 groups after week 4 as ground and cage groups. They were weekly weighed until week 16 and only average weights of female partridges were measured in weeks 20, 23, 27 and 32. The average animal weights between week 4 and week 32 were given (Table 2).

When the table was examined, it could be seen that cage system overcame the ground system in weeks 11, 12, 14 and 15. regarding average animal weights. This

Table1: Nutrition values of concentrated feed given to the rock partidges during feding period

*	DM	RP	RC	RA	RF	OM	NFE	ME
Chick growing feed	92.60	20.21	4	7	4	85.60	57.39	3000
Egg-laying chicken feed	91.80	16.61	6	14.42	4.30	77.38	50.47	2780

DM: Dry Materil (%) RP: Raw Protein (%) RC: Raw Cellulose (%)
RA: Raw Ash (%) RF: Raw Fat (%) ME: Metabolic Energy (kcal/kg)
OM: Organic Material (%) NFE: Nitrogen Free Exract (%)
* These values were calgulated bosed on DM

Table 2 : The averages of live weights of rock partidges between 4 and 32 weeks (g)

	Ground system				Cage system				
Weeks	n	x	Sx	(%)V	n	x	Sx	(%)V	P
4th week	182	102.8	1.78	23.39	135	103.13	2.46	27.74	__
5th week	181	135.27	1.86	18.57	131	136.61	2.58	21.64	__
6th week	179	163.04	2.19	18.01	130	163.96	3.03	21.07	__
7th week	179	202.54	2.33	15.39	130	205.95	3.5	19.38	__
8th week	179	236.75	2.28	12.89	130	242.88	3.78	17.76	__
9th week	179	279.05	3.05	14.63	126	288.69	4.54	17.66	__
10thweek	179	313.21	3.09	13.22	126	322.33	4.72	16.43	__
11thweek	179	351.13	3.17	12.1	126	366.56	4.73	14.5	*
12thweek	123	370.13	3.92	11.74	126	383.53	4.72	13.83	*
13thweek	123	385.98	4.57	13.14	125	417.77	4.61	12.35	**
14thweek	120	411.62	3.99	10.63	125	427.97	4.58	11.98	*
15thweek	118	421.99	4.31	11.1	125	439.68	4.63	11.77	*
16thweek	116	435.76	4.61	11.4	125	445.61	4.5	11.3	*
20th week α	80	460.67	5.9	11.46	79	450.8	4.83	9.54	**
23th week α	80	476.49	5.49	10.32	78	463.76	5.15	9.82	**
27th week α	77	482.62	6.19	11.26	78	475.98	5.37	9.96	**
32th week α	75	490.4	6.27	11.08	76	480.05	6.54	11.88	**

__: p>0.05 *: p<0.05 **: p<0.01 α: Female partidge

Table 3: Life strength values of rock partidges between 4 and 32 weeks

	4-16th week				16-32th week$^{\alpha}$			
Groups	4th week n	16th week n	X^2	Life Strength (%)	16th week n	32th week n	X^2	Life Strength (%)
Ground System	182	116	35.409**	63.73	80	75	0.5	93.75
Cage System	135	125		92.59	79	76		96.2

** P<0.01 α: Female partidge.

phenomenon was also statistically significant. (p<0.05) The same group has also better values at (p<0.01) level in week 13. When the values were checked in these periods, it can be seen that average animal weights of ground and cage groups were 351.33 and 366,56 g in week 11, 370.13 and 383.53 g in week 12, 385.98 and 417.77 g in week 13, 411.62 and 427.97 in week 14 and finally 421,.99 and 439.68 g in week 15, respectively.

Determination of the animal weight increase was concentrated on female partridges after week 16. When the values were checked in weeks 20, 23, 27 and 32, it can be seen that average animal weights of ground and cage groups are 460.77 and 450.80 g; 476.49 and 463.76; 482.62 and 475.98; 490.40 and 480.05 g, respectively. According to these values, it was understood that female partridges in ground group were above than the female partridges in cage group (p<0.01).

Life strength: During the study, dying animals were recorded daily in order to determine the life strength. Life strength values of partridges in cage and ground systems were mentioned in Table 3, together with their statistical evaluations. In ground and cage groups, life strength values were 63.73 and 92.59%, respectively between week 4 and week 16, which shows a significant difference (p<0.01), life strength values were 93.75 and 96.20%, respectively between week 16 and week 32.

DISCUSSION

Animal weight increase: When the average weights of animals in two different groups (ground and cage) were examined in intensive conditions, the values were 102.80 and 103.13 g in week 4; 351.13 and 366.56 g (p<0.05) in week 10; 435.76 and 445.61 g (p<0.05) in week 16. In periods when male and female partridges were kept together, cage group showed better growing properties than ground group. These average values are also similar to the values of some researchers[6,11,12].

Life strength: When the life strengths of animals in two different groups (ground and cage) were examined in intensive conditions, it was observed that cage groups overcame ground groups until week 16 in breeding system applied without separating males and females. In ground and cage groups, life strength values were 63.73 and 92.59%, respectively in this period ($p<0.01$). Partridges in ground group being infected by coccidiosis in week 12, was an important factor in this significant difference. It was also determined by various researchers that, long time breeding of winged animals together carries health risks and may cause economical loss due to coccidiosis[7,8,12].

As a result, effects of breeding system on animal weight and living strength were determined in this study. It was understood that it is possible to breed rock partridges comfortably in intensive conditions and breeding in cage system shows better results than breeding in ground system. It was also understood that, especially breeding long time in ground system does not allow hygiene conditions to be sufficiently provided.

Breeding in ground system is also possible if necessary hygiene conditions are provided. However, it was decided that intensive breeding in cage system is more appropriate regarding congruency of hygiene conditions and growth – living strength of rock partridges.

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