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SOME QUANTITATIVE GENETIC TRAITS IN VIETNAMESE INDIGENOUS NOI CHICKEN FROM 0 TO 28 DAYS OLD

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Abstract: The aim of this study is to characterize some quantitative traits of Noi chicken, one of the Vietnamese famous native breeds for meat quality and fighting, at the stage of 0-28 days old. Therefore, 742 chicks were used to measure, record, analyze and evaluate on these traits. As results, there was significant difference in observation traits among stages of age (P=0.000). Interesting, the wings (+64.88%) and keel lengths (+58.83%) rapidly developed within the first week of life, followed by the most of other dimensions, especially breast diameter (+31.85%), thigh diameter (+71.17%) in the second week of age. An increase in the size of the measurements was due to development of the skeleton at observing time points along the experiment. However, there was strong development of muscle tissue in the second week of life as rate of the breast and thigh diameter was greatest. Noi chicks consumed amount of feed of 16.54 g/bird/day and gained a weight of 6.98 g/bird/day. Thus, their feed conversion ratio was 2.37 at the stage of 0-28 days old. Perhaps a direct positive relationship between observed traits and age were randomly established according biological characteristics of animal. This work provided initial benchmarks of Noi chicks for further studies.

Key words: indigenous Noi chicken breed, measurements, quantitative traits

Introduction

Noi, one of famous local chicken breeds, are playing an important role in increase of farmer's income in rural area of Vietnam. Although Noi is known as an excellent breed with good meat quality, adaptability and natural disease resistant, there is not any evidence for these. Similarly to some countries in the world, Vietnam also increases in demands of native chicken products, in which Noi chicken seems first choices for Southern consumers. At householders in the Mekong delta, Noi is popularly raised in many different ways (backyard, semi-scavenging, intensive/semi-intensive conditions, etc.) for commercial objectives as well as householders own consumption. Until now, a few of studies worked on Noi chickens indicated that *(i)* most of males had the black-red mixed feather color (~42% of population), while females were in brown commonly (~55.6% of population). Most of their shanks were in yellow (42.5-46.4%). Body weight of adult male and female was 2.89 kg/bird and 1.77 kg/bird, respectively (*Ngu et al., 2016*); *(ii)* Earlier studies also indicated that if Noi was raised as a backyard chicken at householders, laying on hers first egg was later than other Vietnamese local chicken breeds. A hen produced around 48.35 eggs/year with an average weight of 48.87 g/egg (Cv% = 3.68) and a yolk percentage of 37.77% (*Quyen and Son, 2008*); *(iii)* Polymorphisms on some genes such as GH, GHR, GHSR, insulin gene (*Khoa et al., 2013*) PRL, VIP, VIPR-1, BMPR-IB, MTNR1C, NPY, DRD2, and IGF-I (*Vu and Ngu, 2016*) were found in Noi chickens; and *(iv)* Recently, genotypes at the NPY/*Dra*I, VIPR-1/*Taq*I and VIPR-1/*Hha*I mutation points significant associated with total egg production of laying Noi chickens of 20 laying weeks were also found (*Ngu et al., 2015*). Generally, although there are many previous studies, most of them focused on traits for genetics and egg performance in Noi chickens. Therefore, growth, feed intake, feed conversion ratio and some measurements in Noi chicks from birth to 28 days old will be characterized in this study.

Materials and methods

Experimental management

A total of 742 chicks generated from the Noi resource population in two previous studies (*Vu and Ngu, 2016; Ngu et al., 2015*) was allotted to 6 private cages with a density of 0.3 m^2/ bird in an opened housing system. One month before the arrival of the chicks, the house was washed, cleaned and sprayed by water, detergent, antiseptic and lime.

The infrared light and thermometer were used to keep a stable warm temperature (around 30^{o}C) for chicks during experiment time. *Ad libitum* feeding was offered to

chicks according to instruction of GreenFeed Vietnam Join stock Company. It is declared that GF1312 feed for backyard chicks is made by main feed stuff ingredients such as soybean cake, fish meal, rice bran, broken rice, corn, wheat bran, cassava mi, amino acids, vitamins and minerals (Table 1). Along the experiment, clean water mixed with ProBAC (containing *Bacillus subtilis, Bacillus licheniformis, Bacillus clausii and Bacillus coagulans* with concentration of $\geq 10^{11}$CFU/g, 1g ProBAC for 5 litters of water) was fully provided for chicks. Supplementation of multivitamins was done at time points of high temperature or after vaccinating with Gumboro and IBV vaccines at the fifth and fourteenth day of age, respectively.

Measured parameters

Body weight, average daily gain, feed intake, feed conversion ratio, beak length, skull length, skull width, neck length, back length, wings length, thigh length, tarsus length, keel length, breast diameter, and thigh diameter (*Francesch et al., 2011; Ojedapo, 2013*) were collected on all experimental chickens at every week of age.

Table 1. Nutrient component of the experimental feed

Items	0-30 days old (GF1312)
Crude protein (min), %	20
Humidity (max), %	14
Crude fiber (max), 5	5
Methionine and cysteine (min), %	0.75
Metabolism energy (min), kcal/kg	2,900
Calcium, %	0.8-1.2
Phosphorus, %	0.6-1.0
Total lysine (min), %	-

Statistical analysis

Chicks were divided into three different groups of hatching weight ($\mu \pm \sigma$) or various stages of age before using R software (ver. 3.4.2) for analyzing statistics. Measurements at various time points were analyzed by descriptive statistics. General Linear Model was applied to analyze effects of groups of hatching weight or stages of age on observed traits.

Results and discussion

In this study, it was demonstrated that all measurements were increased due to aging of chicks (Table 2). These increments were significantly found among

different stages of age (P=0.000) (Table 3). Wings length (64.88%) and keel length (58.83%) developed very early with the highest rate in the first week of life, followed by developing rate of beat length (14.03%), skull length (7.71%), skull width (9.47%), neck length (24.07%), back length (25.29%), thigh length (25.95%), shank length (24.87%), breast diameter (31.85%), thigh diameter (71.17%) at the second week compared with other weeks. No highest measurement was found at the third week of rearing period. Based on our observation, at the end of the second week old, some of chicks could fly 1-2 m far and 0.2-0.4 m high although the first few feathers on their wings had just formed. The early development of wings length and feathers helps the chicks fly and move faster at the beginning of feeding as natural competition among them. This also helps raiser easily to assess health status of herd. At the fourth weeks of age, black length (113.77 vs. 140.1 mm), shank length (25.89 vs 106.9 mm), and keel length (68.38 vs 83.41 mm) of Noi chicks showed lower than those of Marshall ones (*Ojedapo, 2013*) because of difference on daily gain and body weight (225.56 vs 785.63 g/bird) between breeds, respectively. However, it was in contrast for thigh length (89.7 vs 105.04) and breast girth (72.1 vs 115.4) between breeds while their hatching weights were approximate (35.00 vs 34.8 g/bird, respectively) together. This may be due to genetic, feed consumption and weight gain crossing between breeds. Clearly, Marshall chicks' consumption (125.07 vs 152.70 g/bird/day) and gain (51.36 vs 85.80 g/bird/day) was respectively closed to Cobb (*Amao et al., 2015*) but far from Noi chicks. Perhaps, this is the special stage for development of a large skeleton as a basic foundation for development of muscle later in Marshall chicks. More addition, according to *Molenaar et al. (2008)* hatchling length seems to be a better parameter to predict subsequent chick performance, excluding FCR, than hatchling weight.

It is also known that Aseel is also one of famous fighting chicken breeds in India. Recently, *Rajkumar et al. (2017)* reported that at 28 days old, Aseel' shank length was 43.5 mm higher than Noi' one (25.89 mm) in this study. *Rajkumar et al. (2017)* implied that because of fighting purpose, Aseel cocks were selected with longer and stronger shanks and legs either naturally or by farmers. Noi chicks in this study were not selected for those.

In the rural area of Vietnam, besides development of industrial poultry farms investigated by companies, most of the households are dependent on indigenous chickens for their livelihoods and their own consumption. Unfortunately, large amount of genetic potential of the indigenous chicken breeds has not been fully recognized, realized, and utilized. Probably, data linkage among research programs was not good for further objectives. Many studies on the quantitative genetic traits (morphology, productivity and economic efficiency, etc.) in indigenous chickens were done well, but the collected data have no breadth, depth, uniformity and completeness. Therefore, it is not easy to summarize all of them in a set and some

data are still absent in Table 5. Comparing the obtained data in this study with the other data in previous studies in population of Vietnamese native breeds at the first month of age could be fixed for every trait.

A linear increase of the average daily gain, feed intake and feed conversion ratio by aging was found statistically significant in this study (P=0.000) (Table 4). This is consistent with the biological characteristics for growth and development in chickens at early stages of age. During the experimental time, each chick gained 6.98 g/bird and consumed 16.54 g of feed/bird. That means the chick converted 2.37kg of feed into 1 kg of live weight. It demonstrated that feed conversion ratio in Noi chicks was lower than that of other indigenous ones of Vietnam such as Tau Vang chick (*Khoa & Thong, 2013*) and Long Cam chick (*Mui et al., 2012*), Thai native chicken of Thailand (*Jaturasitha et al., 2002*), or other indigenous breeds of Ethiopia such as Tilili, Gellilia, Debre-Elliasm, Mello-Hamusit, Gassay, Guangua, Mecha, and RIR (*Hassen et al., 2006*), but higher than Nhieu Ngon chick of Vietnam (*Thinh et al., 2016*) (Table 5). Although Noi chicks were superior to other indigenous breeds, their feed conversion ratio was 1.5 times higher than that of Abor Acres chicks (*Jaturasitha et al., 2002*) (Table 5). Differences in weight gain, feed consumption and feed conversion ratio among chicks may be due to influence of breeds, nutrition management, nursing conditions, etc. through underdeveloped and developing countries. Furthermore, it was shown that the hatching weight of Abor Acres (44.7 g/bird) was 1.18 to 1.73 times higher than that of other native breeds (ranged from 25.9 to 38.0 g/bird) and 1.28 times compared with Noi chicks. Hatching weight may be influenced by the size, weight and quality of the eggs which they are not easy quickly to improve by genetic and nutritional means.

Table 2. Descriptive statistics for body weight and measurements

Traits	At birth	7 days old	14 days old	21 days olds	28 days old
BW	34.83±5.03	57.79±8.48	104.68±17.37	153.77±29.72	225.56±44.89
Range	20.00-50.00	34.00-88.00	50.00-172.00	59.00-315.00	80.00-370.00
CV%	0.14	0.15	0.17	0.19	0.20
BL	12.86±0.55	14.48±0.65	16.49±0.79	18.50±1.13	20.88±1.06
Range	11.45-15.07	11.30-16.41	13.43-19.97	15.16-21.80	16.54-27.72
CV%	0.04	0.04	0.05	0.06	0.05
SL	17.52±0.65	18.23±0.56	19.59±0.66	20.77±0.78	22.26±0.86
Range	14.29-19.01	14.98-19.90	14.56-21.18	18.24-23.85	19.17-24.97
CV%	0.04	0.03	0.03	0.04	0.04
SW	15.98±0.60	17.04±0.76	18.59±0.83	19.77±0.80	21.49±0.99
Range	13.68-17.94	14.62-18.90	14.96-20.26	17.06-22.26	18.00-29.25
CV%	0.04	0.04	0.04	0.04	0.05
NL	41.57±3.81	45.61±3.67	56.69±5.58	66.74±5.74	76.30±5.89
Range	30.00-50.00	30.00-57.00	45.00-100.00	55.00-95.00	57.00-95.00
CV%	0.09	0.08	0.10	0.09	0.08
BaL	57.09±3.88	66.68±3.82	83.41±5.74	99.70±7.55	113.77±7.72
Range	46.00-69.00	55.00-80.00	67.00-100.00	80.00-120.00	80.00-135.00
CV%	0.07	0.06	0.07	0.08	0.07
WL	118.26±7.12	154.70±9.11	197.85±14.01	229.14±16.57	262.47±18.33
Range	87.00-140.00	115.00-175.00	100.00-240.00	150.00-280.00	190.00-315.00
CV%	0.06	0.06	0.07	0.07	0.07
TL	51.49±3.30	59.27±3.91	74.60±5.37	87.94±7.14	105.04±8.67
Range	41.00-63.00	46.00-70.00	55.00-90.00	63.00-115.00	72.00-175.00
CV%	0.06	0.07	0.07	0.08	0.08
ShL	14.64±1.86	15.41±0.95	19.18±1.61	22.32±2.28	25.89±2.07
Range	10.00-23.00	13.00-19.00	13.00-24.00	12.00-28.00	20.00-36.00
CV%	0.13	0.06	0.08	0.10	0.08
KL	20.49±2.29	32.30±4.97	46.90±4.65	58.32±5.21	68.38±5.84
Range	14.00-27.00	20.00-60.00	30.00-66.00	39.00-75.00	45.00-86.00
CV%	0.11	0.15	0.10	0.09	0.09
BD	75.05±5.05	87.03±6.52	114.32±7.02	133.53±9.19	155.40±11.01
Range	56.00-85.00	65.00-103.00	89.00-132.00	90.00-150.00	106.00-188.00
CV%	0.07	0.07	0.06	0.07	0.07
TD	18.25±1.93	21.12±1.40	36.03±3.34	43.78±4.66	49.79±5.10
Range	13.00-22.00	15.00-24.00	23.00-41.00	24.00-55.00	35.00-66.00
CV%	0.11	0.07	0.09	0.11	0.10

BW: body weight (g/bird); BL: beak length (mm); SL: skull length (mm); SW: skull width (mm); NL: neck length (mm); BaL: back length (mm); WL: wings length (mm); TL: thigh length (mm); ShL: shank length (mm); KL: keel length (mm); BD: breast diameter (mm); TD: thigh diameter (mm).

Table 3. Increase in the lengths of Noi chickens at different stages of age

Traits	0-7	0-14	0-21	0-28	7-14	7-21	7-28	14-21	14-28	21-28	P
BL	1.64±0.10	3.67±0.28	5.71±0.66	8.10±0.64	2.03±0.17	4.08±0.56	6.46±0.54	2.04±0.44	4.43±0.41	2.39±0.26	
%	12.76^{b}±0.48	28.53^{f}±1.35	44.30^{g}±3.24	62.91^{h}±2.54	14.03^{c}±0.84	28.03^{e}±2.65	44.56^{g}±2.00	12.29^{a}±2.07	26.81^{d}±1.35	12.97^{b}±1.68	0.000
SL	0.73±0.11	2.14±0.12	3.32±0.22	4.82±0.64	1.41±0.12	2.59±0.30	4.09±0.64	1.18±0.23	2.69±0.64	1.54±0.62	
%	4.21^{a}±0.82	12.20^{d}±0.77	18.94^{g}±0.93	27.57^{i}±3.85	7.71^{c}±0.48	14.17^{f}±1.29	22.45^{h}±3.50	6.04^{b}±1.30	13.74^{e}±3.41	7.45^{c}±3.08	0.000
SW	1.07±0.21	2.68±0.31	3.87±0.27	5.59±0.53	1.61±0.14	2.80±0.16	4.53±0.43	1.19±0.15	2.92±0.38	1.72±0.34	
%	6.64^{a}±1.15	16.70^{e}±1.49	24.18^{g}±0.85	34.94^{h}±2.25	9.47^{c}±0.89	26.63^{g}±2.86	6.44^{a}±0.94	6.44^{a}±0.94	15.70^{d}±1.82	8.70^{b}±1.45	0.000
NL	4.32±1.25	15.09±1.98	25.41±2.44	35.09±3.01	10.86±2.23	21.17±3.08	30.85±3.16	10.31±1.89	19.99±1.91	9.68±1.61	
%	10.35^{a}±3.21	36.73^{e}±6.78	61.84^{g}±9.84	61.84^{g}±9.84	24.07^{d}±5.92	46.90^{i}±9.06	68.27^{h}±10.57	18.41^{c}±4.06	35.63^{e}±5.14	14.62^{b}±2.83	0.000
BaL	9.77±0.62	26.54±2.38	42.95±4.32	57.08±4.56	16.77±2.32	33.18±4.32	47.31±4.52	16.42±2.45	30.54±2.67	14.16±1.29	
%	17.20^{b}±1.65	46.79^{f}±6.03	75.77^{i}±10.70	100.64^{j}±12.37	25.29^{d}±4.19	50.05^{g}±8.02	71.31^{h}±9.13	19.84^{c}±3.71	36.86^{e}±4.80	14.26^{a}±1.91	0.000
WL	36.82±3.26	80.06±7.97	111.58±10.04	145.05±12.11	43.59±3.92	74.77±7.92	108.24±9.98	31.52±5.84	64.99±7.09	33.47±3.40	
%	64.88^{e}±7.93	141.09^{g}±18.54	196.77^{h}±25.69	255.74^{i}±31.77	28.16^{b}±3.97	48.61^{d}±6.88	70.35^{f}±9.01	16.10^{a}±3.75	33.15^{c}±5.57	14.71^{a}±2.02	0.000
TL	7.93±1.10	23.22±2.31	36.63±3.98	53.82±6.06	15.29±1.69	28.70±3.36	53.82±6.06	13.41±1.94	30.60±4.27	17.19±3.17	
%	15.50^{a}±2.68	45.37^{f}±6.22	71.61^{h}±10.46	105.20^{j}±15.92	25.95^{d}±3.70	48.74^{g}±7.37	91.39^{i}±13.71	18.13^{b}±3.29	41.35^{e}±7.48	19.73^{c}±4.59	0.000
ShL	1.08±0.47	4.80±0.53	7.98±1.17	11.56±0.99	3.80±0.78	6.98±1.45	10.54±1.35	3.18±0.85	6.75±0.86	3.58±0.82	
%	7.82^{a}±2.78	33.39^{d}±5.86	55.52^{g}±11.58	80.30^{i}±13.11	24.87^{c}±6.15	45.68^{f}±11.15	68.98^{h}±11.84	16.81^{b}±5.12	35.59^{e}±6.54	16.23^{b}±4.43	0.000
KL	11.79±2.55	26.50±2.49	38.06±3.18	48.13±3.89	14.71±0.85	26.26±1.33	36.34±1.90	11.55±1.13	21.63±1.68	10.07±0.98	
%	58.83^{d}±16.54	131.66^{g}±23.38	189.07^{h}±32.98	239.05^{i}±40.98	46.72^{c}±8.08	83.55^{e}±15.46	115.59^{f}±21.40	25.00^{b}±4.39	46.76^{c}±7.46	17.46^{a}±2.73	0.000
BD	12.06±1.88	39.59±2.48	58.92±4.73	80.84±6.59	27.53±2.07	46.85±3.54	68.77±5.23	19.33±2.94	41.24±4.73	21.92±2.77	
%	16.21^{a}±3.13	53.10^{d}±5.98	79.09^{e}±10.28	108.53^{f}±14.39	31.85^{b}±3.70	54.28^{d}± 6.96	79.70^{e}±10.50	17.05^{a}±3.23	36.36^{c}±5.78	16.56^{a}± 2.85	0.000
TD	2.87±0.77	17.78±1.74	25.53±2.82	31.54±3.23	14.91±2.10	22.66±3.34	28.67±3.78	7.75±2.01	13.76±2.33	6.01±0.99	
%	15.83^{a}±4.33	98.91^{e}±16.26	142.18^{h}±26.22	175.67^{i}±31.86	71.17^{d}±12.55	108.26^{f}±20.67	136.96^{g}±24.61	21.96^{b}±7.40	38.90^{c}±9.99	13.97^{a}±3.24	0.000

BL: beak length (mm); SL: skull length (mm); SW: skull width (mm); NL: neck length (mm); BaL: back length (mm); WL: wings length (mm); TL: thigh length (mm); ShL: shank length (mm); KL: keel length (mm); BD: breast diameter (mm); TD: thigh diameter (mm).

Table 4. Descriptive statistics for average daily gain, feed intake, and feed conversion ratio at different stages of age

	0-7	0-14	0-21	0-28	7-14	7-21	7-28	14-21	14-28	21-28	P
ADG	3.67^{a}±0.17	5.14^{b}±0.08	5.93^{c}±0.07	6.98^{d}±0.14	6.62^{d}±0.33	7.06^{de}±0.18	8.08^{f}±0.18	7.50^{e}±0.33	8.82^{g}±0.31	10.13^{h}±0.55	0.000
Range	3.46-3.83	5.08-5.24	5.86-6.01	6.82-7.14	6.33-7.03	6.94-7.29	7.86-8.25	7.38-7.57	8.54-9.21	9.70-10.84	
CV%	4.69	1.50	1.14	2.05	4.93	2.54	2.26	1.29	3.53	5.45	
FI	6.70^{a}±0.24	10.36^{b}±0.41	13.23^{c}±0.62	16.54^{d}±0.80	14.02^{c}±0.61	16.50^{d}±0.80	19.82^{e}±0.99	18.98^{e}±1.28	22.72^{f}±1.27	26.46^{g}±1.41	0.000
Range	6.39-6.87	9.89-10.80	12.45-13.73	15.50-17.08	13.39-14.75	15.48-17.16	18.54-20.49	17.56-20.42	21.11-23.78	24.66-27.57	
CV%	3.62	3.93	4.65	4.87	4.39	4.87	5.01	6.74	5.58	5.32	
FCR	1.87^{a}±0.09	2.01^{ab}±0.09	2.23^{c}±0.08	2.37^{cd}±0.08	2.19^{bc}±0.17	2.34^{cd}±0.09	2.45^{de}±0.07	2.59^{ef}±0.09	2.58^{ef}±0.12	2.71^{f}±0.14	0.000
Range	1.79-1.99	1.94-2.13	2.12-2.29	2.27-2.45	1.98-2.33	2.23-2.43	2.36-2.51	2.50-2.70	2.47-2.73	2.54-2.84	
CV%	4.98	4.41	3.78	3.38	7.70	3.74	2.94	3.53	4.71	5.07	

ADG: average daily gain (g/bird/day); FI: feed intake (g/bird/day); FCR: feed conversion ratio.

Table 5. Summary of body weight, average daily gain, feed intake and feed conversion ratio of local chicken breeds in some countries

Local chicken breed	BW0	BW28	ADG	FI	FCR	Source
Vietnam						
- Noi	34.83	225.56	6.98	16.54	2.37	This study
- Tau Vang	38.00	319.90	10.07	24.80	2.48	Khoa & Thong, 2013
- Long Cam	28.78	125.76	3.46	15.01	2.42	Mui et al., 2012
- Nhieu Ngon	27.98	270.60	8.67	-	-	Thinh et al., 2016
- Ri	29.28	231.39	7.22	-	-	Mui & Dang, 2016
- H'Mong	26.80	263.25	8.84	18.21	2.05	Phuong et al., 2017
India						
- Aseel	28.9	142.4	-	-	-	Rajkumar et al., 2017
Thailand						
- Thai	30.91	213.27	5.78	24.15	4.12	Jaturasitha et al., 2002
Pakistan						
- Lakha	30.83	202.50	6.13	-	-	Jatol (2014)
- Mianwali	30.66	219.79	6.75		-	Jatol (2014)
- Mushki	30.75	229.60	7.10	-	-	Jatol (2014)
- Peshawari	29.90	210.60	6.45	-	-	Jatol (2014)
Ethiopia						
- Tilili	27.00	134.00	3.80	24.90	6.50	Hassen et al., 2006
- Gellilia	28.20	126.00	3.50	33.60	9.60	Hassen et al., 2006
- Debre-Ellias	27.00	127.00	3.60	34.20	9.50	Hassen et al., 2006
- Mello-Hamusit	26.00	137.00	4.00	26.20	6.60	Hassen et al., 2006
- Gassay	25.90	119.00	3.30	28.80	8.70	Hassen et al., 2006
- Guangua	29.00	142.00	4.00	24.80	6.20	Hassen et al., 2006
- Mecha	28.00	146.00	4.20	25.50	6.10	Hassen et al., 2006
- RIR	36.00	137.00	3.60	23.40	6.50	Hassen et al., 2006
Commercial chicken						
- Abor Acres	44.70	1186.39	40.77	64.72	1.56	Jaturasitha et al., 2002

BW0: hatching weight (g/bird); BW28: body weight at 28 days old (g/bird); ADG: average daily gain (g/bird/day); FCR: feed conversion ratio.

Conclusion

Study on quantitative traits in Noi chicks at the first month of age indicated a linear increase in body measurements, growth and feed conversion ratio, at which the length of wings developed very early in the first week of life, followed by the other dimensions, remarkably the development of breast and thigh diameter, in the second week. In general, the development of observed parameters is due to aging.

Kvantitativne genetske osobine pilića vijetnamske autohtone rase Noi starosti od 0 do 28 dana

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Rezime

Cilj ove studije je da opiše neke kvantitativne osobine pilića rase Noi, jedne od vijetnamskih poznatih autohtonih rasa za meso i borbu, u starosti od 0 do 28 dana. Ukupno 742 pilića je korišćeno za merenje, evidenciju, analizu i procenu ovih osobina. Rezultati su pokazali da postoji značajna razlika u posmatranim osobinama među starosnim dobima (P = 0,000). Zanimljivo je da su se krila (+ 64,88%) i dužine kobilice (+ 58,83%) brzo razvila u prvoj nedelji života, a zatim i većina drugih dimenzija, posebno obim grudi (+ 31,85%), obim bataka (+ 71,17%) u drugoj nedelji starosti. Povećanje vrednosti su rezultat razvoja skeleta u različitim vremenskim tačkama posmatranja tokom eksperimenta. Međutim, u drugoj nedelji života došlo je do snažnog razvoja mišićnog tkiva, pošto je stopa obima grudi i bataka bila najveća. Noi pilići su konzumirali količinu hrane od 16,54 g/ptica/dan i dobijali su težinu od 6,98 g/ptica/dan. Tako je koeficijent konverzije hrane iznosio 2,37 u starosti 0-28 dana. Možda je direktna pozitivna veza između posmatranih osobina i starosti nasumično određena prema biološkim karakteristikama životinje. Ovaj rad je pružio početne standarde Noi pilića za dalja istraživanja.

Ključne riječi: autohtona rasa živine Noi, merenja, kvantitativne osobine

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References

AMAO S.R., OJEDAPO L.O., OSO O.E. (2015): Evaluation of two commercial broiler strains differing in efficiency of feed utilization. Journal of New Sciences, 14(1): 432-437.

FRANCESCH A., VILLALBA I., CARTAÑÀ M. (2011): Methodology for morphological characterization of chicken and its application to compare Penedesenca and Empordanesa breeds. Animal Genetic Resources, 48: 79–84.

HASSEN H., NESER F.W.C, DESSIE T., DE KOCK A., VAN MARLE-KOSTER E. (2006): Studies on the growth performance of native chicken ecotypes and RIR chicken under improved management system in Northwest Ethiopia. Livestock Research for Rural Development, 18, Article #76. Retrieved December 3, 2018, from http://www.lrrd.org/lrrd18/6/hass18076.htm

JATOI A.S., IQBAL M., SAHOTA A.W., AKRAM M., JAVED K., JASPAL M.H., MEHMOOD S., HUSSAIN J., HAMEED T., KHAN M.S., ABBAS Y., AHMAD S., ISHAQ H.M. (2014): Comparative growth performance in four varieties of native Aseel chickens maintained in Pakistan. Pakistan Journal of Zoology, 46 (6): 1565-1571.

JATURASITHA S., LEANGWUNTA V., LEOTARAGUL A., PHONGPHAEW A., APICHARTSRUNGKOON T., SIMASATHITKUL N., VEARASILP T., WORACHAI L., TER MEULEN U. (2002): A comparative study of Thai native chicken and broiler on productive performance, carcass and meat quality. Deutscher Tropentag 2002 Witzenhausen, October 9-11.

KHOA D.V.A., KHANG N.T.K., NGU N.T., MATEY Y., LOAN H.T.P., THUY N.T.D. (2013): Single Nucleotide Polymorphisms in Gh, Ghr, Ghsr and Insulin Candidate Genes in Chicken Breeds of Vietnam. Greener Journal of Agricultural Sciences, 3(10): 716-724.

KHOA D.V.A., THONG N.M. (2013): Ảnh hưởng của các loại thức ăn công nghiệp lên khả năng sinh trưởng và FCR ở gà Tàu Vàng giai đoạn 1 - 4 tuần tuổi. Tạp chí Khoa học Trường Đại học Cần Thơ, 25: 114-118 (in Vietnamese).

MOLENAAR R., REIJRINK I.A.M., MEIJERHOF R., VAN DEN BRAND H. (2008): Relationship between hatchling length and weight on later productive performance in broilers. World's Poultry Science Journal, 64: 599-603.

MUI N.B., DANG P.K. (2016) Khả năng sản suất của gà Ri và con lai (Ri-Sasso-Lương Phượng) nuôi tại An Dương, Hải Phòng. Tạp chí Khoa học Nông nghiệp Việt Nam, 14(3): 392-399 (in Vietnamese).

MUI N.B., THANH N.C., DUC L.A., HIEU N.B. (2012): Đặc điểm ngoại hình và khả năng cho thịt của gà địa phương lông cằm tại Lục Ngạn, Bắc Giang. Tạp chí Khoa học và Phát triển, 10(7): 978-985 (in Vietnamese).

NGU, N.T., NHAN N.T.H., HON N.V., QUYEN N.V., MUOI N.T., VU C.T., XUAN N.H., NGHIA H.C. (2016): Đặc điểm ngoại hình của gà Nòi nuôi tại Đồng bằng sông Cửu Long. Tạp chí KHKT Chăn nuôi 203: 7-14 (in Vietnamese).

NGU N.T., XUAN N.T.H., VU C.T., AN N.T., DUNG T.N., NHAN N.T.H. (2015): Effects of genetic polymorphisms on egg production in indigenous Noi chicken. Journal of Experimental Biology and Agricultural Sciences, 3(VI): 487-493.

OJEDAPO L.O. (2013): Evaluation of body weight and other linear parameters of marshall broiler for repeatability estimates. International Journal of Applied Agriculture and Apiculture Research, 9 (1&2): 175-181.

PHUONG, N.T., DUY N.V.,. TON V.D (2017): Khả năng sinh trưởng và chất lượng thịt của gà H'Mông nuôi theo phương thức công nghiệp. Tạp chí Khoa học Nông nghiệp Việt Nam, 15(4): 438-445 (in Vietnamese).

QUYEN N.V., SON V.V. (2008): Ảnh hưởng của các mức năng lượng trao đổi và protein thô đến khả năng sinh sản của gà Nòi nuôi thả vườn ở đồng bằng sông Cửu Long: Tạp chí KHKT Chăn nuôi, 8(2): 19-25 (in Vietnamese).

RAJKUMAR U., HAUNSHI S., PASWAN C., RAJU M.V.L.N., RAMA RAO S.V., CHATTERJEE R.N. (2017): Characterization of indigenous Aseel chicken breed for morphological, growth, production, and meat composition traits from India. Poultry Science, 96: 2120-2126.

THINH N.H., DANG P.K., HANG V.T.T., TUAN H.A., DOAN B.H. (2016): Một số đặc điểm ngoại hình, khả năng sản xuất của gà nhiều ngón nuôi tại rừng quốc gia Xuân Sơn, huyện Tân Sơn, tỉnh Phú Thọ. Tạp chí Khoa học và Phát triển, 14(1): 9-20 (in Vietnamese).

VU C.T., NGU N.T. (2016): Single nucleotide polymorphisms in candidate genes associated with egg production traits in native Noi chicken of Vietnam. International Journal of Plant, Animal and Environmental Sciences, 6(1): 162-169.

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