

## Journal of the Hellenic Veterinary Medical Society

Vol 73, No 4 (2022)



**Development and identifying quantitative and quantities traits for breeding of Samae Dam Chicken (*Gallus gallus*), Thailand: Diversity of phenotypic characteristics**

*T Wiyabot, S Kiattinarueyut*

doi: [10.12681/jhvms.27405](https://doi.org/10.12681/jhvms.27405)

Copyright © 2023, thunwa wiyabot



This work is licensed under a [Creative Commons Attribution-NonCommercial 4.0](https://creativecommons.org/licenses/by-nc/4.0/).

### To cite this article:

Wiyabot, T., & Kiattinarueyut, S. (2023). Development and identifying quantitative and quantities traits for breeding of Samae Dam Chicken (*Gallus gallus*), Thailand: Diversity of phenotypic characteristics. *Journal of the Hellenic Veterinary Medical Society*, 73(4), 4763–4772. <https://doi.org/10.12681/jhvms.27405>

## Development and identifying quantitative and quantities traits for breeding of Samae Dam Chicken (*Gallus gallus*), Thailand: Diversity of phenotypic characteristics

T. Wiyabot<sup>1,\*</sup> , S. Kiattinarueyut<sup>2</sup>

<sup>1</sup>*Department of Agricultural Technology, Faculty of Agricultural Technology and Industrial Technology, Nakhon Sawan Rajabhat University, Nakhon Sawan Province, Thailand*

<sup>2</sup>*A source of conservation and learning of Samae Dam chicken species, Uthai Thani Province, Thailand*

**ABSTRACT:** This study's objectives were to develop and identify quantitative and quantity traits for Samae Dam Chicken (*Gallus gallus*) in Uthai Thani Province, Thailand by studying the diversity of phenotypic characteristics in the rearing system. The average age of chickens was eight months, randomly numbered 1,000 in Uthai Thani Province. The results showed that males tend to vary in quantitative characteristics such as body weight, height, body length, body width, wing length, and long shank and toe length higher than females and quantitative characteristics of the mean male and female mean were  $3.0 \pm 0.25$  kg/hr.,  $58.5 \pm 0.10$  cm.,  $24.5 \pm 0.30$  cm.,  $14.5 \pm 0.20$  cm.,  $33.0 \pm 1.15$  cm.,  $10.25 \pm 0.5$  cm. and  $5.75 \pm 0.45$  cm., respectively. Correlation between qualitative characteristics positive correlations was found for beak color and stem color, necklace color, and wing feather color, necklace and back necklace color, wing feather color and necklace color, wing feather color, and back necklace color, necklace back color, and necklace color, necklace back color and feather color, shank color, and beak color. Correlations between quantitative attributes and positive correlations were found. Correlation of beak color to body height, necklace color to body weight, necklace color to body width, feather color to body length, wing color to body width, color wing-length plumage, body-weighted tail type, body-height tail type, long-tailed type of the tail feathers is broad, the tail feathers are wing length, the tail feathers are long-stemmed, the color of the stem is weighted, and the color of the stem is height and the color of the stem with the body length. Qualitative characteristics on quantitative characteristics of rooster necklace color, feather color, wings, tail type, necklace tail color, and stem color were statistically different ( $p < 0.05$ ).

**Keywords:** Phenotypic; Samae Dam Chicken (*Gallus gallus*); Thailand

*Corresponding Author:*

T. Wiyabot, Department of Agricultural Technology,  
Faculty of Agricultural Technology and Industrial Technology,  
Nakhon Sawan Rajabhat University, Nakhon Sawan Province,  
Thailand. 60000.  
E-mail address: Thunwa.thun8@gmail.com; Thunwa.w@nsru.ac.th

*Date of initial submission: 02-07-2021*  
*Date of acceptance: 31-05-2022*

## INTRODUCTION

Raising native chickens and people's way of life since ancient times. Native chicken meat can be used as a cheap protein food. And readily available for household consumption and is also a good source of additional income for farmers. Because the local chicken is popular with consumers. Therefore, the market is in high demand. The indigenous chickens raised in the countryside are diverse. (Duangjinda et al., 2012; Daikwo et al., 2011) Study of native chicken biodiversity. This is a study that can assess the status of chickens. And it can be used for conservation by limiting hunting and increasing the population. Promote farming as a supplementary occupation due to differences in herds, geography, breeding, selection, and inbreeding contribute to the biodiversity of the native chickens. (Duangjinda et al., 2012; HRDI, 2017) Especially Samae Dam chicken (*Gallus gallus*). It is an ancient and endangered species. Samae Dam chicken (*Gallus gallus*) is one of the four primary colors of the black-tailed (Apuno et al., 2011; Yaemkong, 2014). The scientific name is *Gallus gallus* characteristics are the mouth, shin bones, spur nails, black eyes, ear coverings, wing feathers, tail feathers, and tail feathers are completely black. There was no other color mixed with the crest and black skin, the fur was completely black except for the wing necklace, the necklace, the back necklace, the black ruffle, or the burnt tamarind. When he stood, he looked elegant and graceful. All parts of the body are completely black. Especially the face and skin should be blacker than the male. Black macaques, when hatched, will see the whole-body black. The black macaque chicken (*Gallus gallus*) is an ancient breed of chicken from the Sukhothai period from King Bang Klang Hao and King Ramkhamhaeng the Great. Evidence shows that the Samae Dam chicken (*Gallus gallus*) originated in the central region from Ayutthaya, Ang Thong, Sing Buri, Uthai Thani, and nearby provinces. (Mekchay et al., 2014; Maw et al., 2015; Department of Livestock, 2021). And Uthai Thani province, a province in Thailand's central region, is considered the birthplace of such species. The area is approximately 6,730 square kilometers, latitude/longitude: 15° 22' 60" N / 99° 33' 0" E, and the current amount of farming of Samae Dam chickens (*Gallus gallus*) in Uthai Thani Province, about 10,000 (HRDI, 2017; Department of Livestock, 2021)

Therefore, this study focuses on the study's diversity of phenotypic characteristics of Samae Dam Chicken (*Gallus gallus*) for development potential and conservation in Uthai Thani Province, Thailand.

## MATERIALS AND METHODS

Development and identify quantitative and quantity traits for Samae Dam Chicken (*Gallus gallus*) in Uthai Thani Province, Thailand as part of a research project on the development and technology transfer for local production of Samae Dam (*Gallus gallus*) breeders in Uthai Thani Province, Thailand. This trial was reviewed through funding, animal ethics, a committee for scientific work, and experimentation with NSRU-IACUC No 202006 certificates. With the following method

### Trial design

Protocol for sampling for preliminary data recording of Samae Dam Chicken (*Gallus gallus*) by interviewing farmers and personal records in Uthai Thani Province, Thailand. The planning, combining the diversity of phenotypic characteristics from the farmer's cohort, in the semi-farm and the Samae Dam Chicken (*Gallus gallus*) layouts were examined. The mean phenotypic diversity in each farm included 1,000 samples of chicken farms in Uthai Thani Province.

### Data collection

Collected samples from the farm using field observations, direct measurements, and imaging methods from male and female Samae Dam Chicken (*Gallus gallus*). The average age of chickens was eight months, randomly numbered 1,000 in Uthai Thani Province. The following analyses were carried out for the qualitative and quantitative relationship studies. Eleven qualitative traits were classified as Eyelet Color (EC), Beak Color (BC), Comb Color (CC), Necklace Color (NC), Wings Feather Color (WFC), Back-Necklace Color (BNC), Tail Feathers Color (TFC), Shank Color (SC), Nail and Foot Color (NFC), Spur Color (SC1) and Skin Color (SC1). And seven quantitative traits were measured Body Weight (BW; kg), Body Height (BH; cm), Body Length (BL; cm), Body Width (BW; cm), Wing Length (WL; cm), Shank Length (SL; cm) and Toe Length (TL; cm).

### Data analysis

Analyzed by the mean of phenotypic diversity in each farm. The frequency procedure was used for descriptive statistics. The least-squares mean for fixed effects and differences between subclasses within fixed effects were compared using a t-test (Yaemkong and Tuan, 2019). Means procedures are computed to examine the range using the General Linear Model (GLM) procedure (SAS, 2003). These effects were



considered significant at  $P < 0.05$ . Probability values of  $P > 0.05$  were considered not significant.

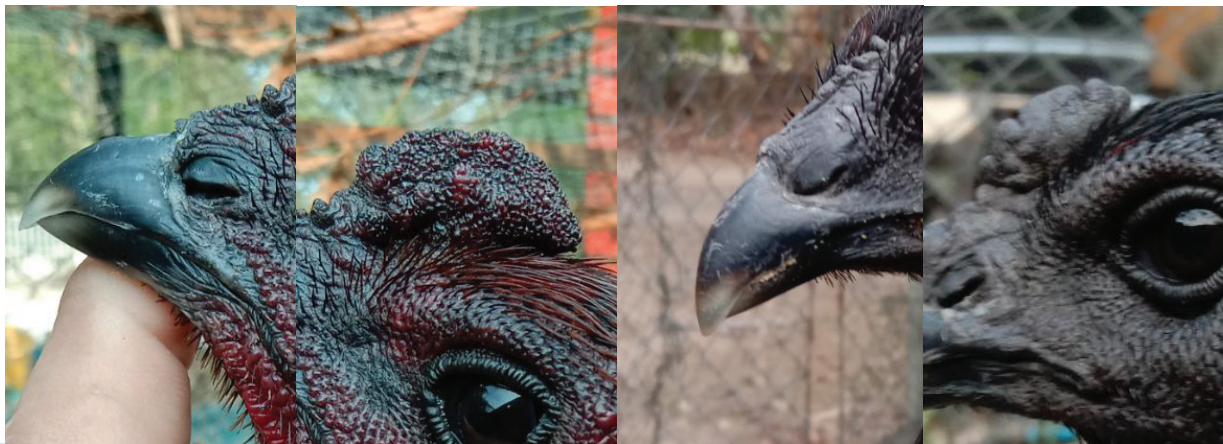
## RESULTS

Development and identify quantitative and quantity traits for Samae Dam Chicken (*Gallus gallus*) in Uthai Thani Province, Thailand by studying the diversity of phenotypic characteristics in the rear-

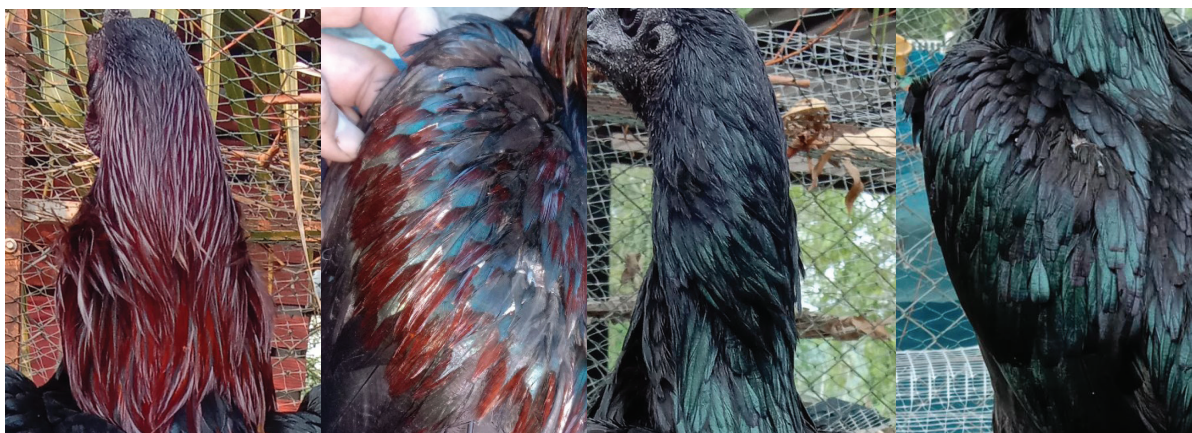
ing system. The results of the survey showed that. A variety of the quantitative characteristics of male and female chickens such as Eyelet Color (EC), Beak Color (BC), Comb Color (CC), Necklace Color (NC), Wings Feather Color (WFC), Back-Necklace Color (BNC), Tail Feathers Color (TFC), Shank Color (SC), Nail and Foot Color (NFC) and Spur Color (SC). As shown in Figures 1-6.



**Figure 1.** The phenotypic characteristics of Samae Dam Chicken (*Gallus gallus*) and Eye (A) Cock and (B) Hen



**Figure 2.** The phenotypic characteristics of Beak and Comb (A) Cock and (B) Hen



**Figure 3.** The phenotypic characteristics of Necklace and Wings Feather (A) Cock and (B) Hen





**Figure 4.** The phenotypic characteristics of Back Necklace and Tail Feathers(A) Cock and (B) Hen



**Figure 5.** The phenotypic characteristics of Shank, Nail, and Foot (A) Cock and (B) Hen



**Figure 6.** The phenotypic characteristics of Spur (A) Cock and (B) Hen

The quantitative characteristics of Samae Dam Chickens (*Gallus gallus*) in Uthai Thani Province, Thailand for least-squares mean (LSM) and standard errors. The variation of quantitative traits such as body weight, body height, body length, body width, wing length, shank length, and toe length, In males  $3.5 \pm 0.20$  kg/h,  $65 \pm 0.05$  cm,  $26 \pm 0.45$  cm,  $16 \pm 0.14$  cm,  $34 \pm 1.03$

cm,  $11 \pm 0.75$  cm, and  $6 \pm 2.50$  cm respectively., In female  $2.5 \pm 0.30$  kg/h,  $52 \pm 0.08$  cm,  $23 \pm 0.24$  cm,  $13 \pm 0.54$  cm,  $32 \pm 1.10$  cm,  $9.5 \pm 0.60$  cm,  $5.5 \pm 1.50$  cm respectively. Quantitative characteristics, the mean is equal to  $3.0 \pm 0.25$  kg/h,  $58.5 \pm 0.10$  cm,  $24.5 \pm 0.30$  cm,  $14.5 \pm 0.20$  cm,  $33.0 \pm 1.15$  cm,  $10.25 \pm 0.5$  cm and  $5.75 \pm 0.45$  cm respectively. As shown in Table 1.

**Table 1.** The quantitative characteristics of Samae Dam Chickens (*Gallus gallus*) in Uthai Thani Province, Thailand for least-squares mean (LSM) and standard errors

Quantitation traits	Least Square Means standard errors of Cock	Least Square Means standard error of Hen	Mean
Body Weight (kg/h)	3.5±0.20	2.5±0.30	3.0±0.25
Body height (cm)	65±0.05	52±0.08	58.5±0.10
Body length (cm)	26±0.45	23±0.24	24.5±0.30
Body width (cm)	16±0.14	13±0.54	14.5±0.20
Wing length (cm)	34±1.03	32±1.10	33.0±1.15
Shank Length (cm)	11±0.75	9.5±0.60	10.25±0.50
Toes length* (cm)	6±2.50	5.5±1.50	5.7±0.45

**Note:** \*Average every inch

The relationship between qualitative characteristics. The result was showed significant strong positive relationships between beak color and shank color ( $r=0.70$ ;  $p<0.05$ ), between necklace color and wings, feather color ( $r=0.60$ ;  $p<0.01$ ), between necklace color and black-necklace color ( $r=0.15$ ;  $p<0.01$ ), between wings, feathers color and necklace color ( $r=0.60$ ;  $p<0.01$ ), between wing feather color and back-necklace color ( $r=0.25$ ;  $p<0.01$ ), between back-necklace color and necklace color ( $r=0.20$ ;  $p<0.05$ ), between back-necklace color and wings,

feather color ( $r=0.25$ ;  $p<0.01$ ) and between shank color and beak color ( $r=0.50$ ;  $p<0.01$ ) as shown in *Table 2*. The relationship between quantitative characteristics and all positive relationships among the studied quantitative traits was significant ( $r=0.30$  to  $0.55$ ;  $p<0.01$ ). *Table 3*.

The relationship between qualitative and quantitative characteristics in which the relationship between factors is significant ( $p<0.05$ ). As *Table 4*.

**Table 2.** The correlation among qualitative traits of Samae Dam Chickens (*Gallus gallus*) in Uthai Thani Province, Thailand

Quantitative traits	Eyelet color	Beak color	Comb color	Necklace color	Wings Feathercolor	Back-Necklacecolor	Tail Feather color	Shank color	Nail and Foot color	Spur color	Skin color
Eyelet color	1.00	0.12	-0.07	-0.06	-0.02	-0.00	-0.00	0.01	-0.03	0.00	0.06
Beak color	0.01	1.00	0.00	-0.07	-0.03	-0.01	-0.07		-0.01	-0.04	0.07
Comb color	0.07	-0.06	1.00	-0.05	0.00	-0.01	0.06	0.00	-0.09	-0.08	-0.04
Necklace color	-0.03	-0.00	-0.06	1.00	0.60*	0.15**	0.04	0.06	-0.05	0.05	0.05
Wings Feathers color	-0.00	-0.03	0.00	0.60**	1.00	0.25**	0.05	0.09	0.04	0.09	0.06
Back-Necklace color	-0.01	-0.03	-0.06	0.20*	0.25**	1.00	-0.03	0.00	0.05	0.02	0.08
Tail Feathers type	-0.03	0.01	-0.05	0.01	-0.02	0.03	1.00	0.04	0.08	0.03	-0.00
Shank color	-0.27	0.50**	-0.08	-0.01	-0.14	-0.04	-0.01	1.00	-0.03	0.08	-0.00
Nail and Foot color	-0.05	-0.02	0.06	-0.01	-0.10	0.08	-0.18	-0.03	1.00	0.09	0.05
Spur color	0.07	-0.11	-0.03	-0.05	-0.07	-0.00	-0.06	-0.03	-0.08	1.00	-0.08
Skin color	0.06	0.04	0.00	-0.15	0.03	-0.07	0.00	0.04	-0.00	0.00	1.00

**Note:** \*\* Correlation is significant at 0.01% level and \*Correlation is significant at 0.05% level.

**Table 3.** The correlation among qualitative traits of Samae Dam Chickens (*Gallus gallus*) in Uthai Thani Province, Thailand

Quantitative traits	Bodyweight	Body height	Body length	Body width	Wing length	Shank length	Toes length
Body weight (kg/h)	1.00	0.45**	0.30**	0.50**	0.55**	0.32**	0.35**
Body height (cm)	0.45**	1.00	0.45**	0.47**	0.48**	0.49**	0.45**
Body length (cm)	0.30**	0.48**	1.00	0.45**	0.50**	0.35**	0.34**
Body width (cm)	0.55**	0.47**	0.45**	1.00	0.52**	0.37**	0.30**
Wing length (cm)	0.50**	0.51**	0.44**	0.50**	1.00	0.45**	0.44**
Shank length (cm)	0.30**	0.45**	0.39**	0.30**	0.32**	1.00	0.40**
Toes length (cm)	0.35**	0.40**	0.37**	0.35**	0.30**	0.40**	1.00

Note: \*\* Correlation is significant at 0.01% level and \*Correlation is significant at 0.05% level.

**Table 4.** The correlation among qualitative traits of Samae Dam Chickens (*Gallus gallus*) in Uthai Thani Province, Thailand

Quantitative traits	Bodyweight	Body height	Body length	Body width	Wing length	Shank length	Toes length
Eyelet color	0.04	0.01	0.07	0.03	0.05	-0.06	-0.05
Beak color	0.02	0.14*	0.45	0.05	0.04	-0.03	-0.01
Comb color	0.06	0.04	0.05	-0.05	0.06	-0.01	0.06
Necklace color	0.15*	-0.10	0.07	0.17*	0.08	0.20	-0.02
Wings Feather color	0.11	-0.15*	-0.24**	0.00**	0.35	0.30	0.07
Back Necklace color	0.04	-0.25	0.23**	-0.20**	-0.14**	0.09	0.06
Tail Feather style	-0.25**	-0.19**	-0.26**	-0.12**	-0.14**	-0.22**	0.06
Shank color	-0.22**	-0.18**	-0.22**	-0.11	-0.16	-0.06	0.00
Nail and Foot color	0.04	0.08	0.08	0.05	0.01	0.05	0.06
Spur color	0.14	0.15	-0.12	0.13	-0.00	-0.04	0.13
Skin color	0.03	0.12	-0.05	0.02	0.10	0.00	-0.00

Note: \*\* Correlation is significant at 0.01% level and \*Correlation is significant at 0.05% level.

The results from this study demonstrated the positive correlation of beak color with body height ( $r=0.14$ ), necklace color with bodyweight ( $r=0.15$ ), necklace color with body width ( $r=0.17$ ), wings, feather color with body length ( $r=0.23$ ), wings feather color with body width ( $r=-0.20$ ), wing feather color with wing length ( $r=-0.14$ ), tail feather type with bodyweight ( $r=-0.25$ ), tail feathers type with body height ( $r=-0.19$ ), tail feather type with body length ( $r=-0.26$ ), tail feather type with body width ( $r=-0.12$ ), tail feather type with wing length. The results from this study demonstrated the positive correlation of beak color with body height ( $r=0.14$ ), necklace color with bodyweight ( $r=0.15$ ), necklace color with body width ( $r=0.17$ ), wings, feather color with body length ( $r=0.23$ ), wings feather color with body width ( $r=-0.20$ ), wing feather color with a wing length ( $r=-0.14$ ), tail feather type with ( $r=-0.14$ ), tail feather type with a shank length ( $r=-0.22$ ), shank color with bodyweight ( $r=-0.22$ ), shank color with body height ( $r=-0.18$ ) and shank color with body length ( $r=-0.22$ ).

The effects of qualitative characteristics on quantitative characteristics of the chicken, eye color, beak

color, comb color, nail and foot, pure color, and skin color had no significant difference ( $p>0.05$ ). As shown in Table 5.

Necklace color significantly affected body height and body width ( $p<0.05$ ). The tamarind seed necklace color had a higher body height ( $64.50\pm0.09$  cm) than burnt tamarind seed ( $64.00\pm1.65$  cm), tamarind seed necklace color had a higher body width ( $15.25\pm0.60$  cm) than burnt tamarind seed ( $15.50\pm0.25$  cm).

Wing feather color had a significant effect on body length ( $p<0.05$ ), burnt tamarind seed wings, feather color had a higher body length ( $25.30\pm0.66$  cm) than tamarind seed ( $25.15\pm0.94$  cm).

Back necklace color had a significant effect on body width ( $p<0.05$ ), tamarind seed back necklace color had a higher body width ( $14.50\pm0.19$  cm) than burnt tamarind seed ( $15.30\pm0.09$  cm).

Tail feather type significantly affected body weight, body height, body length, body width, wing length, and toe length ( $p<0.05$ ). The coconut tail feather type had a higher body weight ( $3.15\pm0.75$



**Table 5.** The least-squares mean (LSM) and standard errors qualitative and qualitative traits of Samae Dam Chickens (*Gallus gallus*) in Uthai Thani Province, Thailand

Traits	Body Weight (kg/h)	Body Height (cm)	Body Length (cm)	Body Width (cm)	Wing Length (cm)	Shank Length (cm)	Toes Length (cm)
Eyelet color	0.2620	0.1127	0.0800	0.0715	0.0611	0.0720	0.0813
Black	3.30±0.24	64.50±0.11	25.20±0.87	15.00±1.25	33.50±0.87	10.50±0.66	5.84±0.09
Red	3.00±0.25	63.50±0.19	23.10±0.94	13.23±0.24	32.15±0.75	9.25±0.87	5.00±0.85
Yellowish white	2.71±0.66	62.50±1.25	23.20±0.25	13.20±0.60	32.45±0.19	9.50±1.07	5.10±1.85
Beak color	0.0583	0.1027	0.0782	0.0671	0.0713	0.1082	0.2500
Black	3.20±0.11	63.50±0.94	25.00±0.24	15.50±0.60	33.00±1.07	10.50±1.25	5.70±1.65
Yellowish white	3.11±0.19	63.00±0.24	24.50±0.09	15.20±0.11	32.15±0.25	9.50±0.87	5.65±0.09
Red	3.00±0.24	62.50±0.87	22.50±1.85	14.20±1.25	32.60±0.19	9.20±0.85	5.50±0.25
Ivory	2.91±0.87	62.00±0.60	22.00±0.19	14.62±0.87	30.10±0.11	9.50±0.60	5.25±0.66
Ecru	2.75±0.25	60.00±0.25	21.00±1.07	13.50±0.66	30.15±0.94	8.75±0.09	5.20±0.24
Yellow	2.65±0.11	62.30±1.65	21.30±1.75	13.25±0.24	31.50±0.24	8.80±0.66	5.11±1.15
Blackish Green	2.60±1.25	62.40±0.19	20.14±0.75	13.52±0.85	31.25±0.09	8.50±1.65	5.00±1.85
Comb color	0.0611	0.0812	0.0917	0.2050	0.2120	0.1120	0.1240
Blackish red	3.35±0.75	62.50±0.25	24.00±1.25	15.25±0.11	33.00±0.19	10.50±1.25	5.86±0.60
Black	3.05±0.19	63.50±0.60	25.50±0.85	15.30±0.09	33.50±0.94	10.00±0.11	5.70±1.85
Necklace color	0.1520	<0.0012*	0.1250	0.0022*	0.3222	0.4500	0.0681
Tamarind seed	3.18±0.24	64.50±0.09	24.50±1.25	15.50±0.25	23.00±0.19	10.20±0.24	5.53±1.25
Burnt tamarind seed	3.39±0.09	64.00±1.65	24.00±0.94	15.25±0.60	32.14±0.87	10.50±1.07	5.50±0.75
Wings Feather color	0.0617	0.1360	0.0033*	0.1150	0.2550	0.1850	0.0752
Tamarind seed	3.46±1.25	63.00±0.19	25.15±0.94	14.50±0.11	32.50±0.66	9.55±0.25	5.20±1.65
Burnt tamarind seed	3.36±0.87	64.50±0.11	25.30±0.66	14.20±1.25	32.10±0.75	9.80±0.87	5.60±0.11
Back Necklacecolor	0.1776	0.2100	0.0615	0.0080*	0.0811	0.0912	0.3517
Tamarind seed	3.33±0.19	64.00±0.11	24.50±0.25	15.30±0.09	33.20±0.25	9.71±1.25	5.60±0.19
Burnt tamarind seed	3.42±0.25	63.50±0.60	25.00±0.87	14.50±0.19	33.50±0.09	9.85±0.94	5.35
Tail Feather style	0.0051*	0.0212*	0.0220*	0.0174*	0.0296*	0.2154	<0.0001*
Coconut tail	3.20±0.66	64.00±1.07	25.00±0.66	15.00±0.19	33.20±0.87	10.45±1.25	5.90±0.09
Fantail	3.15±0.75	63.50±0.94	24.50±0.25	10.56±1.65	33.00±0.85	10.20±0.19	5.85±1.65
Shankcolor	0.0021*	0.1150	0.0707	0.0811	0.2150	0.3110	0.1701
Yellowish white	2.70±0.23	60.00±0.94	24.50±1.07	15.30±0.25	33.54±1.25	9.50±1.25	5.50±0.09
Green	2.75±0.66	61.50±0.19	23.12±0.25	15.45±0.60	33.15±0.09	9.60±0.24	5.00±0.19
Yellow	2.85±0.24	61.00±0.11	23.14±0.09	14.30±1.85	31.40±0.87	9.70	5.25±0.60
White	2.95±0.85	62.50±1.65	24.30±0.85	14.50±0.19	31.50±0.09	9.10±0.85	5.90±0.75
Black	3.32±0.09	64.50±0.25	25.14±0.66	13.60±0.11	32.60±0.75	10.50±0.24	5.10±0.24
Gray	3.10±1.77	63.50±1.85	25.16±0.75	13.25±1.07	32.45±1.75	10.25±1.07	5.30±0.14
Nail and Foot	0.2253	0.0810	0.2150	0.2111	0.1300	0.1010	0.0600
Black	3.35±0.94	63.50±0.25	25.00±0.24	15.24±0.24	33.50±0.87	10.20±0.19	5.80±0.85
Other	3.30±0.60	62.50±0.11	24.50±1.25	15.60±0.94	33.25±0.66	10.15±0.60	5.26±0.24
Spur color	0.2857	0.0713	0.0730	0.0811	0.2101	0.2350	0.0611
Black	3.25±0.11	64.50±1.25	25.01±0.19	15.30±0.09	33.00±0.75	9.55±0.11	5.75±0.66
Other	3.00±0.25	63.80±0.24	24.00±0.87	15.22±0.85	33.50±0.60	9.35±0.94	5.60±0.09
Skin color	0.3500	0.0920	0.0710	0.1130	0.1227	0.1337	0.2101
Blackish red	3.25±0.24	63.00±0.19	24.00±0.94	14.25±0.24	32.00±0.87	9.15±1.25	5.55±0.19
Black	3.31±1.25	63.50±0.25	25.00±0.75	15.40±0.11	33.25±0.24	9.75±0.25	5.50±0.24

Note: \* Means with a superscript in a row are statistical differences P&lt;0.05



kg/h) than the fantail ( $3.20 \pm 0.66$  kg/h). The coconut tail feather type had a higher body height ( $64.00 \pm 1.07$  cm) than the fantail ( $63.50 \pm 0.94$  cm).

Shank color significantly affected body weight ( $p < 0.05$ ). Black shank color had a higher body length ( $3.32 \pm 0.09$  cm) than other groups.

## DISCUSSION

The studying diversity of phenotypic characteristics in the rearing system. It is found that the appearance of the chickens will be more diverse. Yaemkong and Tuan (2016) reported that as the Necklace is red, yellow, green, etc., the shining color is black, yellow, black, yellow, etc., indicating that the chicken has the appearance of a chicken. Black-Tailed Pradauk Most likely not purebred chickens. It found that in the North and the Northeast, indigenous chickens were raised. The most popular breeds are raised in both regions, namely the Pradu Chicken and the Yellow Chicken (Kanya, 2017).

Generally, the Samae Dam chickens (*Gallus galus*) are medium-sized. The male weighs approximately 3.00-3.50 kg. The female weighs 2.00-3.00 kg (Department of Livestock, 2021). Body width, the chest-length, body length, and shin-length of the native chicken were  $3493.1 \pm 324.9$  g,  $7.2 \pm 0.4$  cm,  $13.3 \pm 0.7$  cm,  $22.6 \pm 1.0$  cm, and  $10.7 \pm 0.6$  cm, respectively. (Yaemkong, 2014; Kavin et al., 2016) Faruque et al., 2010; Abinawanto et al., (2017) also reported that the body weight, shank length, and wing length of the native chicken were 1.67 kg, 11.26 cm, and 23.21 cm, respectively. Biodiversity Singh et al. (2016) reported in their study that the characteristic of Thai native chicken was higher and slimmer than the broiler and adult male native chicken was 3.0-3.5 kg of average body weight. Studied chickens with 13.99 months, and Yaemkong, (2014); Yaemkong and Tuan, (2016). Reported the age of 18-36 months for native chickens in Phitsanulok Province, additionally.

The beak is the most lack In line with the study of quint and his team (2016), the morphology of indigenous chickens of the tribes of Nan Province was studied. It found that the male indigenous chickens surveyed had the most lack of mouth (36.75%). Tabassum et al., (2014); Kavin et al., (2016) found that the diversity of crest traits in the indigenous chickens was found. Males referred to by local popularity obtained from the survey found 11 species. (Maw et al., 2015; Yaemkong, 2014; Yaemkong and Tuan, 2016)

reported that Thai native chickens are mostly male. It has more than 98.60% of the pea comb's crest or pea comb, with only 1.40% of the crest. The black hair, although most of them are black and yellow.

Suphawadee (2019) reports that when considering the overall appearance of the native chicken, all breeds. It was found that the most rock-crest features (89.46%), followed by a fan's tail (77.00%).

The genetic diversity of Thai Native Chickens (TNCs) using morphological classification varies according to the changing environment. The results showed that the similarity coefficient between populations was in the range of 0.6597- 0.7802. (Maw et al., 2015; Abinawanto and Effendi, 2017; Usaneeporn et al., 2018) and Mekchay et al., (2014); Maw et al., (2015) reported that native chickens exhibited a moderate variability in their body weight characteristics. It depends on the local chickens of the northern region. Will have a relatively low weight Compared to the Isaan and the central, northeastern chickens or the brood eyelet that collected most of the breed.

Tamphonphimon et al., (2013); Yamkong and Tuan (2019) found a black mouth (91.4%), and a black shin (75.7%). The breeds were full-haired, all-black (56.9%), and shin-black (93.1%). As Yaemkong, 2014; Kitja et al. (2019) said, eye color was found to be black (97.85%)

Kitja et al. (2019); Yaemkong and Tuan, (2019). found that most of the necklace colors were red (31.18%), followed by flower-make (22.58%) (Kitja et al., 2019)

Black shank color had a higher body length ( $3.32 \pm 0.09$  cm) than other groups. (Kitja et al., 2019), and Buranawit et al. (2016) and Laenoi et al. (2015) showed that chickens surveyed in Thailand. Mostly black shins (55.60%)

In addition, Yamkong and Tuan (2019); Kitja et al., (2019). Diversity of Thai indigenous chickens studied the phenotype of tail feather color observed at 20 weeks of age. Changes at about 28-32 weeks. The sins of the female chickens were mostly black (89.4%), crest-like crest, 98.1%.

## CONCLUSION

The quantitative and quantitative characteristics of *Gallus gallus* in Uthai Thani province, Thailand, showed that male chickens tended to vary in quantitative characteristics such as body weight, height,

body length, body width, wing length, and length. Long stalk and toe taller than female and quantitative characteristics. The mean male and female mean were  $3.0 \pm 0.25$  kg/h,  $58.5 \pm 0.10$  cm,  $24.5 \pm 0.30$  cm,  $14.5 \pm 0.20$  cm,  $33.0 \pm 1.15$  cm,  $10.25 \pm 0.5$  cm, and  $5.75 \pm 0.45$  cm. respectively. As for the relationship between the qualitative characteristics, it was found that a positive relationship was Beak color and stem color, necklace color, and wing feather color, necklace and necklace back color wing feather color and necklace color, wing, feather color, and back necklace color Necklace back color and necklace color, necklace back color and feather color, stem color, and beak color for the relationship between quantitative attributes and positive correlations. A relationship between beak color and body height was found in necklace color and body weight necklace color and body width feather color and body length wing color and body width feather color according to wing length body weight tail color tail type, body height long tail feathers wide, long tail feathers on the wings, long tail feathers, the color of the stem are weighted and

the color of the stem is high and the color of the trunk with the body length.

This study found that the Samae Dam chicken (*Gallus gallus*) has distinctive breeding characteristics. Can tell the characteristics of the species and used as the basic information that is important in the Improvement and conservation planning of native chicken breeds at the local level in Thailand further.

## ACKNOWLEDGMENT

The authors would like to thank the research and development institute, Nakhon Sawan Rajabhat University. Nakhon Sawan Province, Thailand. And thank you to the Scientific Laboratory Animal Ethics Committee for the NSRU-IACUC No 202006 certification as part of the development and technology transfer project for the local production of (*Gallus gallus*) breeders in Uthai Thani, Thailand.

## CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

## REFERENCES

- Apuno AAM, Bap ST, Ibrahim T (2011) Characterization of local chickens (*Gallus gallus domesticus*) in Shelling and Song Local Government Areas of Adamawa State, Nigeria. *Agric Biol J North America* 2: 6-14. DOI:10.5251/abjna.2011.2.1.6.14.
- Abinawanto A, Effendi PS (2017) Biodiversity of the Gaga chicken from Pinrang, South Sulawesi, Indonesia based on the bioacoustic analysis and Morphometric study. *Biodiversitas* 18: 1618-623. DOI:10.13057/bio div/d180441.
- Buranawit KC, Chailungka C, Wongsunsi W, Laenoi (2016) Phenotypic characterization of Thai native black-bone chickens indigenous to northern Thailand. *Thai J. Vet. Med* 46: 547-554.
- Duangjinda M, Choprakarn K, Suwanlee S, Amnueysit P, Thieme O (2012) Impact of the avian influenza outbreak on indigenous chicken genetic resources in Thailand. *World's Poultry Science* 68: 503-512. DOI:10.1017/S004393391200608.
- Daikwo ISO, Kipe AAO, Cheja JO (2011) Phenotypic Characterization of Local Chickens in Dekina. *Int J Poult Sci* 10: 444-447. DOI:10.3923/ijps.2011.444.447.
- Department of Livestock (2021) Biodiversity Research Group, Animal Breeding Division, Department of Livestock Development, Bangkok.
- Faruque S, Siddiquee NUA, from MA, Islam MS (2010) Phenotypic characterization of Native Chicken are reared under an intensive management system. *J Bangladesh Agric Univ* 8: 79-82. DOI:10.3329/bias.v45i1.27489.
- Guni FS, Katule AM (2013) Characterization of local chickens in selected districts of the Southern Highlands of Tanzania: I. Qualitative characters. *Livest Res Rural Devel* 25(9). <http://www.lrrd.org/lrrd25/9/guni25153.htm>.
- Highland Research and Development Institute (HRDI) (2017) Support for research and development work of the Royal Project And research, extending local wisdom and creating appropriate innovations. Address: 65 Moo 1, Suthep Road, Suthep Subdistrict Mueang District, Chiang Mai Province 50200.
- Kavin KP, Kecha K, Pramuan T, Sombattha W, Nipana S (2016) A study of the morphology of indigenous chickens of tribes in Nan Province. *Agriculture Core* 44(Special Edition 1): 377-381.
- Kanyakit T (2018) Variety of indigenous chickens in the North and Northeast of Thailand. Academic seminars. Animal Science, Faculty of Agriculture Ubon Ratchathani University.
- Kitja M, Rapeepan L, Thitiwat Y, Wirot L, Patthanun K, Prapasiri J, Tuan NN, Suphawadee Y (2019) A diversity of characteristics of fighting cocks in fighting cock farms at Wang Tong District, Phitsanulok Province. *khonkaen agr J* 47: suppl.
- Laenoi WK, Buranawit WK (2015) Phenotypic characterization and farm management of indigenous chicken reared in the highland region of northern Thailand. *Agric Sci Procedia* 5: 127-132. DOI:10.1016/j.aaspro.2015.08.019.
- Maw AA, Kawabe K, Shimogiri T, Rerkamnuaychoke W, Kawamoto Y, Masuda S, Okamoto S (2005) Genetic diversity and population structure in Native Chicken populations from Myanmar, Thailand, and Laos by Using 102 Indels Markers. *Asian-Australas J Anim Sci* 28: 14-19. DOI:10.5713/ajas.14.0212.
- Mekchay S, Supakankul P, Assawamakin A, Wilantho A, Chareanchim W, Tongsim S (2014) Population structure of four Thai indigenous chicken breeds. *BMC Genetics* 15: 1-9. DOI:10.3382/jar/pfy062.
- Pornpimon J, Supon P, Amonrat W (2013) A study of the Black-Tailed

- chicken Farming System in Chiang Mai is a sustainable career for farmers. Chiang Rai Province. Complete report. Supported by the Thailand Research Fund (TRF).
- Singh MK, Nayak GD, Sardar KK (2016) Phenotypic characterization of native chicken populations reared under family-based free-range scavenging system in Odisha, India. *Indian J Anim Res* 50: 839-845.
- Supawadee Y (2014) Variety of characteristics of indigenous chickens. In the area of Phitsanulok Province. Variety of appearance of native chickens in the area of Phitsanulok Rajabhat Journal of Sciences, Humanities & Social Sciences 15 (2): 63-73.
- SAS Institute (2003) SAS/STAT® user's Guide v9. SAS Institute Inc, Cary, North Carolina.
- Tabassum F, Hoque MA, Islam F, Ritchie CH, Faruque MO, Bhuiyan AKFH (2014) Phenotypic and morphometric characterization of indigenous chickens at Jhenaigati-upazila of Sherpur district in Bangladesh. *SAARC J Agric* 12: 154-169. DOI:10.3329/sja.v12i2.21927.
- Usaneeporn S, Suphawadee Y, Rangsun C, Phutthipan S (2018) Diversity of local feedstuffs on the shank-color of indigenous chickens in Chartrakarn District, Phitsanulok. *khonkaenagoJ* 46. suppl. 1: (2018).
- Yaemkong S, Tuan NN (2016) Phenotypic Characterization of Native Chicken Ecotypes in Lower Northern, Thailand. In: The 17th Asian-Australasian Association of Animal Production Societies Animal Science Congress. Fukuoka, Japan, 22-25 August 2016.
- Yaemkong S (2014) Diversity of phenotypic characteristics of Thai Indigenous Chicken in Phitsanulok Province. *Rajabhat J Sci Humanit Soc Sci* 15: 63-73. DOI:10.13057/biodiv/d200517.
- Yaemkong SRP, Nguyen NT, Charoensuk R, Chirarat N, Soipethand U, Sirikanda Y (2017) Diversity of Traditional Knowledge and Local Wisdom of Indigenous Chickens Farmers in Bang Krathum, Nakhon Thai, Mueang, and Chat Trakan Districts Phitsanulok Province. *J Appl Ani Sci* 10: 39-46.
- Yaemkong S, Tuan NN (2019) Diversity of phenotypic characteristics of White Tailed-Yellow Chicken populations are reared under the free-range system in Phitsanulok Province, Thailand. *Biodiversitas* 20: 1271-1280. DOI: 10.13057/biodiv/d200517.