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Characterization of Morphometry, Morphology, Growth and Carcass Traits of *Pati* Ducks under Semi-intensive System

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ABSTRACT

A study was conducted during April, 2022 to Mrach, 2025 at the duckery unit of Livestock Research Station, Mandira under the Directorate of Research, Assam Veterinary and Fishery University, Khanapara, Guwahati (781 022) India, to characterize morphology, morphometry, growth and carcass traits of *Pati* ducks reared under semi-intensive system. A total of 200 unsexed day-old ducklings were procured and were reared under semi-intensive system for the biological trial. The body weights (g) of male ducks were significantly (p<0.05) higher than female ducks from 20th weeks onwards of age. The age at first egg and annual egg production in *Pati* ducks were recorded as 185.21±2.31 days and 71.07±0.87 numbers respectively. The egg weights (g) at 40th week were recorded to be 68.01±0.66. The survivability rates recorded as 72.16±1.31 and 83.14±1.42% during 0 to 20th week and 21st to 52nd weeks respectively. *Pati* ducks had a multiple plumage colour with white skin, yellow shank, and web. The pre-slaughter live weights were not significantly (p>0.05) different among sexes at 20 weeks of age. Among the different cut-up parts, the breast part in both sexes exhibited the highest yield followed by back, neck with skin, giblet, drumstick and wing. It may be concluded that *Pati* ducks grew quickly up to 32nd weeks of age and then slowed down. They matured late, laid fewer eggs and had higher early mortality. However, better care, nutrition, management and selective breeding could improve their performance and boost income for rural farmers of Assam.

KEYWORDS: *Pati* ducks, morphometry, morphology, body weight, egg production

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1. INTRODUCTION

Duck is the second most important species of poultry reared for egg and meat production and has economic, social, and ecological values. Duck farming harnesses family labour efficiently and makes use of locally available feed resources to achieve food security, generate income, and provide employment for women and children (Islam et al., 2026). Duck meat and eggs are popular and relished by people throughout the world and it is strongly flavored than either chicken or turkey and it has high nutritional value with complete essential amino acid composition and good fatty acids. Compared to broiler meat, duck egg and meat contains higher percentages of protein and fiber, lower percentages of fat (Starcevic et al., 2021). Duck meat output has increased from 0.033 mt in 2010 to 0.043 mt in 2020 (Anonymous, 2021), and duck eggs now account for about 1.12% of total national egg production (Anonymous, 2023). Duck farming is an effective tool for the socio-economic upliftment of the rural people regarding their economic independence, improves women empowerment (Jalaludeen and Churchil, 2022). Small-scale duck production contributes considerably to household economy, food security and improves nutritional status of rural populations in developing countries (Islam et al., 2026). Asia is considered as the homeland of ducks contributing around 90 per cent of the world duck population (Veeramani et al., 2016) and 82.6% of the entire duck meat production in the globe (Ismoyowati and Sumarmono, 2019). In 2022, global duck meat production reached 6.07 mt (Anonymous, 2023). It is well known that indigenous ducks contribute substantially to overall duck meat and egg production in the world. In India, indigenous duck contributes more than 90 per cent of total duck egg production (Meshram et al., 2025). As per Anonymous (2019), the total duck population in India is reported to be 33.51 million out of which, 32.5 million (97%) are being reared in the backyard system (Anonymous, 2019). Assam has a total duck population of 11.74 million ducks and holds 2nd rank among Indian states just after West Bengal (Anonymous, 2022). The duck population of Assam has been dominated by indigenous *Pati* ducks (Islam et al., 2002). The *Pati* duck, first Indian native registered duck breed distributed throughout the state of Assam possessing the innate potential to produce eggs and meat on low inputs (Islam et al., 2024). Although they have lower production potential in terms of egg and meat production, they are popular among farming community due to their hardiness and are also well adapted to the tough and harsh local environmental conditions. They are reared traditionally in an uncontrolled mating system resulting in genetic dilution. Improvements in duck production system requires a better knowledge of its prevailing production environment, morpho-physiological and genetic characteristics, with a view to identify intervention needs. Further, Anonymous (2010) recommended the establishment of conservation programmes for the preservation of animal genetic resources in different regions of the world through the identification, characterization, and conservation of local livestock to guarantee food security and meet future animal production needs. However, information on productioncharacteristics of *Pati* ducksis very scanty and there have been very fewsystematic studies of *Pati* ducks of Assam. Information on different production parameters of *Pati* ducks would be helpful for the researchers, policy makers and other stake holders to take appropriate strategies for improvement and conservation of this native germplasm. Keeping the above points in mind, the present was undertaken to know different production parameters, morphometric, and carcass traits of *Pati* ducks under semi-intensive system.

2. MATERIALS AND METHODS

2.1. Location of the study

The study was conducted during April, 2022 to March, 2025 at the duckery unit of Livestock Research Station, Mandira under the Directorate of Research, Assam Veterinary and Fishery University, Khanapara, Guwahati (781 022), India. A total of 200 unsexed day-old Pati ducklings were procured from the hatchery unit of Livestock Research Station, Assam Veterinary and Fishery University, Mandira and were reared in the duckery unit under semi-intensive system.

2.2. Ducks and management practices

The ducks were reared under semi-intensive system, where they were let loose in the morning for scavenging and kept confined during night only. The ducklings were weighed, wing banded and brooded properly and were fed with a hand mixed compound feed (3 kg) composed of rice polish, broken rice, and cooked rice (1:1:1) twice daily up to a period of 4 weeks in confinement. From 5 weeks onwards they were let loose outside in search of feed. In addition to scavenge feeding from outside during 8 am to 4 pm daily, they were also supplemented with hand mixed compound feed (10 kg) composed of rice polish, broken rice, and cooked rice (1:1:1) twice daily throughout the experimental period. The duck shed was cleaned regularly and birds were accessed to clean drinking water throughout the experimental period. The ducks were vaccinated with duck plague vaccine as per standard schedule.

2.3. Traits under study

2.3.1. Production parameters

At the beginning of the study, the day-old body weights of each duckling were recorded. The live body weights (g) were measured in the morning (in empty stomach) with the help of digital weighing balance up to the nearest gram and were recorded. The body weights (g) were recorded

at weekly interval up to 16th week of age. Later the body weights (g) at 20th, 24th, 28th, 32nd, 40th, 52nd, 56th weeks, 24th and 36th months of age were also recorded. The age at first egg (days), annual egg production during first, second and third year (nos.) was also recorded. Eggs were also weighed (g) at 40th week of age and recorded. The survivability rates (%) were also recorded during 1 day to 20 weeks, 21 to 52 weeks, 53 weeks to 24 months and 25 to 36 months.

2.3.2. Morphological traits

For morphological study, a total of 30 ducks (15 males and 15 females) were selected randomly at the age 20 weeks from the flock. Different morphological variants such as plumage colour of head, neck, breast, back, wings, and tail; plumage pattern, bill colour, bill shape, bean colour, eye colour, shank colour, skin colour, web colour, body carriage and egg colours were investigated. All the phenotypic characteristics were observed visually, identified, and documented properly.

2.3.3. Morphometric traits

To study morphometric traits, 10 ducks and 10 drakes were randomly selected at the age of 20 weeks. The morphometric traits (length and breadth) of *Pati* ducks were measured with the help of a digital vernier caliper (mm) while circumference was measured by using measuring tape (cm). The morphometric traits viz. body weight (g), body length, body circumference, skull length, skull circumference, bill length, bill circumference, neck length, neck circumference, wing length, wingspan, shank length, shank circumference, keel length, tail length, back length, thigh length, wing feather length and body feather length were measured and recorded. The length (cm) of trachea along with lengths of different parts of alimentary tract viz. esophagus, proventriculus, duodenum, jejunum, ileum, caecum, and colon were also measured and recorded. Further, length (cm) of infundibulum, magnum, isthmus, and uterus in ducks were measured and documented. Thus, altogether 31 morphometric traits were measured and documented as per standard methods (Anonymous, 2012; Negassa et al., 2014).

2.3.4. Carcass traits

To study carcass traits, the birds (10 ducks and 10 drakes) which were used to study morphometric traits were utilized. The selected ducks were off fed for 12 hrs before slaughter; however, water was offered ad libitum. The pre-slaughter live weights (PSW) (g) of the selected birds were measured and recorded. The ducks were slaughtered in humanely manner as per standard methods. The body weights after bleeding and defeathering were recorded to compute weight of blood and feather. Then the ducks were eviscerated and the dressed weight was recorded. All the carcasses were cut into pieces of different parts viz. head, neck, drumstick, wing, winglet, back, breast and leg. The cut-up parts were weighed (g) individually and recorded. Hearts, livers and gizzards were also weighed separately and recorded. The small and large intestines after removing faecal materials were weighed and recorded. Similarly, tracheas, lungs, oil glands and testes (in drake) were weighed separately and recorded properly.

2.4. Statistical analysis

The mean, standard deviation, standard error, range, frequency distribution and percentage statistical methods were used to tabulate and analyze the data. All the statistical procedures were presented using SPSS V.25.0. A one-way analysis of variance was used to analyze the data (ANOVA). The results were performed as mean±standard errors (SE).

3. RESULTS AND DISCUSSION

3.1. Productive and reproductive parameters

The mean body weights of male and female ducks at different ages were depicted in the Table 1. It was observed that under semi-intensive system, both male and female *Pati* ducks exhibited higher growth rate from day-old to

Table 1: Productive and reproductive parameters of *Pati* duck under semi-intensive system (n=200)

Parameters	Male	Female
Body weight (g) at		
Day-old	42.54±0.37	40.66±0.28
1st week	86.63±0.87	81.32±0.91
2nd week	245.73±1.65	216.33±1.52
3rd week	315.19±1.86	302.74±1.13
4th week	451.01±2.54	417.15±2.15
5th week	456.13±2.29	411.65±2.60
6th week	527.67±3.26	491.62±1.65
7th week	653.14±2.39	620.15±2.77
8th week	715.52±1.64	692.09±1.68
9th week	770.72±2.31	731.05±2.24
10th week	791.62±1.63	770.11±3.24
11th week	837.20±3.26	813.43±1.86
12th week	864.14±1.47	842.29±1.98
13th week	931.36±1.25	903.94±1.84
14th week	961.75±4.91	941.51±3.35
15th week	988.75±5.62	973.15±2.89
16th week	1087.91±6.02	1019.22±6.99
20th week	1283.32±3.01[a]	1133.37±2.98[b]
24th week	1351.07±3.22[a]	1210.02±3.11[b]
28th week	1403.17±3.07[a]	1202.31±4.02[b]
32nd week	1471.11±3.91[a]	1316.63±3.75[b]

Table 1: Continue...

Parameters	Male	Female
40th week	1501.13±3.86	1403.44±3.58
52nd week	1552.62±4.01[a]	1424.12±3.68[b]
56th week	1524.13±3.67[a]	1418.72±3.82[b]
24th month	1575.37±3.21	1463.18±3.09
36th month	1857.07±4.02[a]	1540.61±3.27[b]
Age at first egg (days)	-	185.21±2.31
First year egg production (nos.)	-	71.07±0.87
Second year egg production (nos.)	-	59.23± 0.56
Third year egg production (nos.)	-	46.24±0.87
Egg weight (g) at 40th week of age	-	68.01±0.66
Survivability (%)		
Ducklings up to 20 weeks of age	72.16±1.31	
Adult duck		
21 to 52 weeks	83.14±1.42	
53 weeks to 24 months	85.16±1.08	
25 months to 36 months	90.24±2.06	

Means in the same row with different superscript are significantly different (p<0.05)

4th weeks of age and thereafter the growth rate was slowed down. From 5th to 8th weeks of age, the body weights recorded for both male and female ducks were much lower than body weights recorded for unsexed *Pati* ducks (Dutta et al., 2022), Nageswari ducks (Ahmad et al., 2021) and Deshi black and white ducks (Momu et al., 2022). The body weights recorded at 8th week of age in *Pati* ducks was comparable with body weights of *Chara-Chemballi* ducks (Mahanta et al., 2009) at similar age under range system, however body weights at 12th week of age were found to be higher in *Chara-Chemballi* ducks than *Pati* ducks under semi-intensive system. Further, the body weights of ducks and drakes recorded at 10 months of age were comparable with the body weights recorded at 40th week by Dutta et al. (2024) under field condition of Assam. The adult live weights of *Pati* ducks recorded in the present study were higher than adult body weights of Maithili ducks (Kamal et al., 2020) but lower than the Kashmir ducks (Bihaqi et al., 2014). However, Naik et al. (2022) reported much higher adult body weights of *Pati* ducks and drakes (Drake: 1912 and duck:1800 g) under scavenging system. The body weights of male ducks were numerically higher than female ducks; however, there was no significant difference between body weights of male and female ducks up to 16th week of age. It was also observed that, body weight of male ducks is significantly (p≤0.05) higher than females during 20th, 24th, 32nd, 52nd and 56th week, 24th and 36th months of age. The differences in body weightswithin same breeds or amongdifferent breeds of ducks in different studies might be due to differences in genetic make-up, system of management, quality, and quantity of feed (Ahmad et al., 2021), scavenge feed resources etc. Better management and nutrition could substantially improve the growth rate in *Pati* ducks.

In the present study, the mean age at first egg recorded as 185.21±2.31 days under semi-intensive system (Table 1), corroborated the findings of Islam et al. (2024) in *Pati*, Kamal et al. (2020) in Maithili ducks and Sharma et al. (2003) in Nageswari ducks under scavenging system. However, the present findings were lower than the findings of several earlier researchers (Islam et al., 2002; Bihaqi et al., 2014) in different indigenous duck varieties of India. Morduzzaman et al. (2015) reported the earlier sexual maturity in Nageswari ducks under intensive system. Bharali et al. (2020) and Harikrishnan and Punnuvel (2012) also reported early sexual maturity in *Chara-Chemballi* and *Kuttanad* ducks respectively. The delayed sexual maturity in *Pati* ducks might be due to inferior genetic makeup, nutrition, and seasons.

The mean annual egg production in *Pati* ducks was found to be 71.07±0.87 numbers under semi-intensive system (Table 1). The second and third year egg productions were recorded as 59.23±0.56 and 46.24±0.87 numbers respectively (Table 1). The values recorded in the present study corroborated the findings of Kamal et al. (2022) in indigenous ducks of Jharkhand (66.92±2.00) but higher than Maithili ducks (54.60) of Bihar (Kamal et al., 2023). Several earlier researchers (Mahanta et al., 2001; Islam et al., 2002; Dutta et al., 2024) also recorded higher annual egg production (ranged between 75 to 100) in *Pati* ducks than the present findings under scavenging system of management. Similarly, native ducks of West Bengal and Andaman produced 96.2 and 110 numbers of eggs annually respectively (Halder et al., 2007), higher than the present value.

The mean egg weights of *Pati* ducks at 40th weeks of age recorded as 68.01±0.66 g (Table 1). The findings of the present study were in good conformity with the findings of Dutta et al. (2024) at similar age under scavenging system. However, the present values were lower than the indigenous *Kuttanad* ducks (70 g) of Kerala (Harikrishnan and Ponnuvel, 2012) but higher than Nageswari ducks (62.45 g) of Assam (Sharma et al., 2003), *Chara-Chemballi* ducks (64.36 g) under backyard system in Assam. The difference in the egg weights might be due to different genetic makeup, age of the birds etc.

In the present study, the survivability rate of *Pati* ducks recorded in ducklings and adult ducks (21 to 52 weeks) as 72.16±1.31 and 83.14±1.42% under semi-intensive system (Table 1). It was observed that, the mortality was found to be higher in ducklings might be due to improper brooding, predation etc. however, the mortality declined in subsequent years. Higher percentage of mortality in *Pati* and Nageswari ducks under traditional system was also reported by several workers (Mahanta et al., 2001; Islam et al., 2002; Sharma et al., 2003; Zaman et al., 2005). Padhi et al. (2010) reported moderate mortality per cent among ducklings (7.65%), growers (1.37%) and layer ducks (13.19%) in indigenous ducks of Odisha. However, *Kuzi* ducks recorded a lower mortality rate of 7.07±0.92% and 1.56±1.26% during 0 to 8 and 8 to 20 weeks of age (Padhi et al., 2022) than the present study. Kamal et al. (2020) also reported that more than 10% of the farmers informed mortality percentage of 80 to 85% among *Maithili* ducks during 0 to 2 months of age.

3.2. Morphological traits

The features of different phenotypic traits and their distribution of *Pati* ducks at 20 weeks of age were presented in Table 2.

It was observed that *Pati* ducks had multiple plumage colour (Dutta et al., 2022). The study revealed that majority (87.67%) *Pati* drake had greenish black head, while most (93.33%) of the ducks had mottled brown head. Neck colour was dominated by dark green with white ring and mottled brown with white ring in drakes and ducks respectively. Naik et al. (2022) reported that drakes typically had dark brown plumage with a grayish black head while ducks were solid brown. The plumage colour of breast of both *Pati* drakes and ducks predominantly mottled brown. The bill colour of both drakes and ducks were mostly bright yellow tipped with black, while the bean colour were found to be black. Kamal et al. (2020) observed yellow bill colour of Maithili duck. Kashmir ducks also had mostly yellow bills (Hamadani et al., 2023). The eye and skin colour in both sexes were found to be black and white respectively, while in Kashmir ducks' eye colour were mostly brown. The skin colour of Maithili ducks was also found to be white (Kamal et al., 2020). The shank and web colour in *Pati* drakes and ducks were found to be predominantly yellow. The shank was orange to red in colour in most of the varieties of Maithili ducks (Kamal et al., 2020). The variation of plumage colour in different parts of the body might be due to admixture of this breed with other available genotypes in their habitats.

3.3. Morphometric traits

The morphometric traits of *Pati* ducks at 20 weeks of age are presented in Table 3. The mean neck length of *Pati* drakes and ducks recorded in the present study were in good agreement with the findings of several researchers (Dutta et al., 2022; Kaushik et al., 2021) and comparatively shorter than that of Nageswari ducks (Ahmad et al., 2021; Morduzzaman et al., 2015). Body length has significant effect the overall health, stamina and productivity of the ducks, impacting their suitability for meat production (Islam et al., 2024).

The present findings of mean body length of *Pati* ducks and drakes were lesser than earlier findings (Kaushik et al., 2021), however the corresponding values were higher than findings of some workers (Dutta et al., 2022) in *Pati* ducks and some other workers (Ahmad et al., 2021; Morduzzaman et al., 2015) in Nageswari ducks. The wingspan is crucial for understanding the flight capability and mobility of ducks, which could influence their ability to escape predators and adapt to various environments. The wingspan was longer in *Pati* drakes compared to ducks (Dutta et al., 2022; Kaushik et al., 2021), whereas Nageswari ducks showed similar wing spans for both sexes (Ahmad et al., 2021; Morduzzaman et al., 2015) (Table 3). The bill length was essential for assessing feeding efficiency and dietary preferences, which affect the ducks' ability to thrive in different habitats. The average bill lengths of *Pati* ducks (Dutta et al., 2022; Kaushik et al., 2021) were comparable to Kashmir, Maithili and Nageswari ducks (Ahmad et al., 2021; Bihaqi et al., 2014; Kamal et al., 2020). The shank length influenced walking ability, foraging efficiency and escaping predators, which were important for the ducks' overall fitness and productivity. Shank lengths in *Pati* ducks (Dutta et al., 2022; Kaushik et al., 2021) were similar to Kashmir ducks but shorter compared to Maithili and Nageswari ducks (Bihaqi et al., 2014; Kamal et al., 2020; Ahmad et al., 2021). The head diameter of *Pati* ducks (Kaushik et al., 2021) was lower than the values reported by Dutta et al. (2022), yet similar to that of Nageswari ducks (Morduzzaman et al., 2015). The head diameter was relevant for understanding brain size and sensory capabilities, which could affect behaviour and adaptability. Understanding the morphological and morphometric differences between *Pati* ducks and other breeds was crucial for breed identification, conservation and improvement programmes. These differences highlight the unique characteristics of the *Pati* duck, which were important for its conservation and for distinguishing it from other indigenous and improved breeds. The length (cm) of jejunum in drake was significantly (p<0.05) higher than ducks, while lengths of duodenum, ileum, caecum and colon of *Pati* drake and ducks were statistically similar. Different parts of alimentary canal of *Pati* duck were found to be shorter than Pekin ducks of 7 weeks of age (Wasilewski et al., 2015). The infundibulum and magnum of *Pati* ducks were found to be shorter than Khaki Campbell ducks, while isthmus and uterus were found to be longer than Khaki Campbell ducks (Sari et al., 2014).

Table 2: Morphological characteristics of *Pati* ducks at 20 weeks of age (n=30)

Sl. No.	Morphological traits	Male (n=15)	Female (n=15)	
1. Plumage colour				
	Head	Mottled brown	2 (13.33) *	14 (93.33) *
		Greenish black	13 (87.67)	0 (0.00)
		Black	0 (0.00)	1 (6.67)
	Neck	Dark green with white ring	12 (80.00)	0 (0.00)
		White	1 (6.67)	3 (20.00)
		Mottled brown with white ring	2 (13.33)	12 (80.00)
	Breast	Mottled brown	11 (73.33)	9 (60.00)
		White	0 (0.00)	1 (6.67)
		Reddish brown	3(20.00)	3 (20.00)
		Black	1 (6.67)	2 (13.33)
	Back	Brownish white	3 (20.00)	9 (60.00)
		Black	2 (13.33)	0 (0.00)
		Golden brown with black line	10 (66.67)	6 (40.00)
	Wing	Brownish white	12(80.00)	2 (13.33)
		Golden brown with black line	3 (20.00)	13 (86.67)
	Tail	Dark green	6 (40.00)	0 (0.00)
		Black	9 (60.00)	3 (20.00)
		Brown	0 (0.00)	12 (80.00)
2.	Bill colour	Bright yellow tipped with black	9 (60.00)	10 (66.67)
		Yellow	6 (40.00)	5 (33.33)
3.	Bill shape	Elongated, flattened and uniform	15 (100.00)	15 (100.00)
4.	Bean colour	Black	12 (80.00)	13 (86.67)
		Blackish yellow	3 (20.00)	2 (13.33)
5.	Eye colour	Black	15 (100.00)	15 (100.00)
6.	Shank colour	Yellow	13 (86.67)	14 (93.33)
		Orange	2 (13.33)	1 (6.67)
7.	Skin colour	White	15 (100.00)	15 (100.00)
8.	Web colour	Yellow	15 (100.00)	15 (100.00)
9.	Body carriage	Horizontal	15 (100.00)	15 (100.00)
		Upright	0 (0.00)	0 (0.00)
10.	Egg colour	White	-	15 (100.00)

*Figures in parenthesis denote percentage

3.4. Carcass traits

Carcass characteristics play a pivotal role in both producers' profitability and consumers' purchasing decisions (Ungkusonmongkol and Wattanachant, 2024). Carcass characteristics were found to be influenced by sex (Kokoszynski et al., 2020), breed, production system (Kolluri et al., 2015) etc. Carcass characteristics of *Pati* ducks reared under semi-intensive system at 20 weeks of age have been presented in Table 4. The PSW was although numerically higher in females than males, there was no significant (p>0.05) difference among male and females at 20 weeks of age.

The results indicated that the weights of different cut-up parts showed no significant (p<0.05) difference between

Table 3: Morphometric traits of *Pati* ducks at 20 weeks of age (n=20)

Sl. No.	Morphometric traits	Male	Female
1.	Body weight (g)	1178.12±22.51	1195.15±27.16
2.	Body length (cm)	56.26±1.22	55.13±1.88
3.	Body circumference (cm)	31.75±1.02	34.25±0.97
4.	Skull length (cm)	6.76±0.21	8.35±0.31
5.	Skull circumference (cm)	12.23±0.42	13.21±0.33
6.	Bill length (cm)	5.77±0.61	5.12±0.32
7.	Bill circumference (cm)	6.97±0.75	5.88±0.77
8.	Neck length (cm)	15.66±0.51	15.21±0.64
9.	Neck circumference (cm)	7.82±0.58	7.14±0.41
10.	Wing length (cm)	35.13±1.54	34.57±1.58
11.	Wingspan (cm)	78.81^{a}±2.03	84.12^{b}±2.35
12.	Shank length (cm)	5.53±0.12	5.42±0.14
13.	Shank circumference (cm)	5.34±0.38	4.31±0.29
14.	Keel length (cm)	11.66±0.71	10.50±0.67
15.	Tail length (cm)	3.22±0.08	3.25±0.06
16.	Back length (cm)	23.52±0.68	24.51±0.71
17.	Thigh length (cm)	7.05±0.16	8.21±0.05
18.	Wing feather length (cm)	15.5±.0.57	21.25±0.64
19.	Body feather length (cm)	5.51±0.20	5.75±0.16
20.	Length of trachea (cm)	15.74±0.67	16.51±0.58
21.	Length of esophagus (cm)	21.33±0.87	25.24±0.79
22.	Length of proventriculus (cm)	6.53±0.32	5.65±0.27
23.	Length of duodenum (cm)	27.32±0.97	25.42±0.97
24.	Length of jejunum (cm)	62.51^{a}±2.31	71.55^{b}±2.06
25.	Length of ileum (cm)	59.13±2.04	58.18±2.01
26.	Length of caecum (cm)	18.74±0.84	17.25±0.81
27.	Length of colon (cm)	7.61±0.61	10.75±0.64
28.	Length of infundibulum (cm)	-	5.50±0.24
29.	Length of magnum (cm)	-	18.21±0.67
30.	Length of isthmus (cm)	-	9.56±0.52
31.	Length of uterus (cm)	-	6.51±0.34

Means in the same row with different superscript are significantly different (p<0.05)

two sexes of *Pati* ducks, in contrast Kolluri et al. (2015) reported that weights of different cut-up parts of native male ducks were significantly (p<0.05) higher than their female counterparts except in case of liver, heart, gizzard and thigh. The dressing percentages of *Pati* drakes were numerically higher than *Pati* ducks, however the difference were not significant (p>0.05) between sexes. The dressing percentages recorded in both sexes were comparable with the corresponding values for Moti ducks of Odisha (Padhi et al., 2014) and Pekin, Nageswari and their crossbred ducks (Ahmad et al., 2021), but lower than Korean native and commercial meat type ducks (Kwon et al., 2014), *Nag Hans* ducks of Chattisgarh (Meshram et al., 2025). The neck with skin, wing, drumstick, heart, liver and gizzard

Table 4: Carcass traits of *Pati* ducks at 20th week under semi-intensive system (n=20)

Sl. No.	Carcass traits	Male	Female
1.	Pre-slaughter live weight (g)	1178.12±22.51	1195.15±27.16
2.	Weight after bleeding (g)	1125.50±24.16 (95.51)*	1130.15± (94.56)*
3.	Weight after defeathering (g)	1086.90±20.15 (92.26)	1101.88±21.24 (92.20)
4.	Feather weight (g)	91.22±5.21 (7.74)	93.27±4.97 (7.80)
5.	Dressed weight (g)	772.53±18.24 (65.57)	740.16±17.32 (61.93)
6.	Neck with skin weight (g)	101.74±6.52 (8.64)	96.52±5.21 (8.08)
7.	Head weight (g)	54.54±2.11 (4.63)	54.53±2.33 (4.56)
8.	Drumstick weight (g)	64.53±2.54 (5.48)	62.51±2.61 (5.23)
9.	Wing weight (g)	68.52±2.04 (5.82)	67.53±2.13 (5.65)
10.	Winglet weight (g)	15.08±0.87 (1.28)	15.51±0.92 (1.30)
11.	Back weight (g)	201.57±11.21 (17.10)	210.43±10.24 (17.61)
12.	Breast weight (g)	226.71±10.33 (19.24)	212.62±10.24 (17.79)
13.	Leg weight (g)	23.22±0.58 (1.97)	25.52±0.61 (2.13)
14.	Heart weight (g)	10.92±0.48 (0.93)	8.53±0.41(0.71)
15.	Liver weight (g)	33.41±1.26 (2.83)	38.75±1.57 (3.24)
16.	Gizzard weight (g)	30.90±1.33 (2.62)	32.10±1.42 (2.67)
17.	Giblet weight (g)	75.23±2.84 (6.39)	79.38±3.04 (6.64)
18.	Intestine weight without faecal materials (g)	35.34±2.13 (3.00)	37.43±2.28 (3.13)
19.	Trachea weight (g)	2.61±0.34 (0.22)	2.52±0.32 (0.21)
20.	Lungs weight (g)	4.67±0.61 (0.40)	5.45±0.48 (0.46)
21.	Oil gland weight (g)	7.02±.0.58 (0.60)	6.51±0.54 (0.54)
22.	Testes weight (g)	35.10±1.67 (2.98)	-

*Figures in parenthesis indicate percentage of pre-slaughter live weight (PSW); Means in the same row with different superscript are significantly different (p<0.05)

Figure 1: A flock of *Pati* ducks

Figure 2: A pair of *Pati* ducks

Figure 3: Defeathered carcasses of *Pati* ducks

Figure 4: Different cut-up parts of *Pati* ducks

weights (g) recorded for *Pati* ducks were found to be lower than Nageswari, Pekin and their crossbred ducks kept under intensive system of management (Ahmad et al., 2021). Among the different cut-up parts, the breast part in both sexes exhibited the highest yield (19.24% in males and 17.79% in females) followed by back (Drake: 17.10%; Duck: 17.61%), neck with skin, giblet, drumstick and wing. The yields of feather (Drake: 7.74%; Duck: 7.80% of PSW) were similar with Moti ducks (7.89% of live weight) of Odisha at 8 weeks of age under intensive system of management (Padhi et al., 2014). The per cent head weights in both sexes (Male: 4.63%; Female: 4.56%) of *Pati* ducks were lower than Pekin, Nageswari and their crossbred ducks under semi-intensive system (Sarker et al., 2022). The empty intestinal weights were recorded to be 35.34±2.13 and 37.43±2.28 g for male and female *Pati* ducks respectively and were much lower than Muscovy, Peking and Rouen ducks (Omojola, 2007). The weights (g) of oil gland of *Pati* duck and drake were recorded to be 6.51±0.54 and 7.02±0.58 respectively at 20 weeks of age and the values were similar with the corresponding values reported by earlier workers in Muscovy ducks at 1 year of age (Aljalaud, 2013). The weight of paired testes of *Pati* drake was found to be 35.10±1.67 g at 20 weeks of age and was heavier than Khaki Campbell drake (23.76 g) at 6 months of age (Khatun et al., 2019).

4. CONCLUSION

Pati ducks had mixed plumage, white skin, yellow legs and webs. Males generally had yellow greenish heads, while females mottled brown. They grew faster up to 32nd weeks of age making that good age for harvest for meat. They adopted well in Assam's climate but laid fewer eggs than other native duck breeds. With better care such as proper housing, nutrition, diseases control and brooding both survivability and productivity could improve, helping rural farmers earned steady income.

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