

CARCASS QUALITY ATTRIBUTES OF CAGE-REARED INDIGENOUS SIRUVIDAI, KADAKNATH AND NANDANAM BROILER-3 CHICKEN

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ABSTRACT

A study was conducted to compare the carcass characteristics of indigenous Siruvidai, Kadaknath and Nandanam Broiler-3 chicken reared under cage system of management. The birds were reared in brooder cages from 0 to 12 weeks of age and grower cages from 13 to 16 weeks of age. A total of 24 birds (12 males + 12 females) were selected randomly from each genetic group to study the carcass characteristics. The pre-slaughter body weight and processing yields like New York dressed, eviscerated and ready-to-cook yields were significantly ($P < 0.05$) higher in Nandanam Broiler-3 compared to Kadaknath and indigenous Siruvidai chicken. In processing losses, Kadaknath birds showed significantly ($P < 0.05$) higher feather loss (7.63 %) and head loss (4.76 %), while Nandanam Broiler-3 chicken had significantly ($P < 0.05$) higher blood loss (2.92 %) but lower feather loss (5.48 %), indicating breed-specific variations in body components. The cut-up parts analysis revealed that breast yield was similar across all the breeds (25.28 to 25.78 %); while, Kadaknath chicken showed significantly ($P < 0.05$) higher neck (10.29 %), drumstick (16.87%), and wing (11.73%) yields and indigenous Siruvidai chicken had significantly ($P < 0.05$) higher thigh yield (14.29%). Indigenous breeds (Siruvidai and Kadaknath) showed significantly ($P < 0.05$) higher giblets (6.04-6.67 %) and liver (1.82-1.84 %) yields, and intestinal measurements (13.42 to 13.44 % relative length) compared to Nandanam Broiler-3 chicken.

Key words: Siruvidai, Kadaknath, Nandanam Broiler-3 chicken, relative organ weight, carcass characters

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INTRODUCTION

The poultry sector has witnessed significant growth worldwide, with increasing demand for both commercial and indigenous chicken breeds. While commercial broilers are known for their rapid growth and high meat yield, indigenous chickens hold cultural significance and are

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valued for their unique meat qualities and adaptability to local conditions. India's total meat production (including poultry) was estimated at 9.77 million tonnes in the year 2022-2023 (DAHD, 2024). Poultry meat contributes significantly to this total, accounting for more than 50% of the meat production in the country. Among the poultry meat produced in India, 85-90% of the chicken meat is contributed by the commercial broilers and remaining 10-15% is contributed by the native chicken (Rajkumar *et al.*, 2016). In order to increase meat production from indigenous chicken, understanding the optimum genetic growth potential and carcass characteristics of different chicken breeds is crucial for meeting diverse preferences and increasing demands of the consumer.

Siruvidai is an indigenous chicken ecotype of Tamil Nadu, which is commonly seen in Ariyalur and nearby districts of Tamil Nadu and very popularly used for meat purpose (Churchil *et al.*, 2023a). The meat of Kadaknath breed of chicken has special taste and flavour and presumably known to have better nutrient profile than that of commercial broilers (Haunshi *et al.*, 2022). Nandanam Chicken-3 is a coloured broiler developed for meat purpose (Sangilimadan *et al.*, 2021). Apart from the sex (Churchil and Sagar, 2023) and rearing systems (Wang *et al.*, 2009; Gandhimathi *et al.*, 2023), genetic makeup of the bird has also been found to influence the carcass characteristics in chicken (Reddy *et al.*, 2021). The maximum indigenous growth performance of the birds can be exhibited by the birds reared under cage system of management in

comparison with the deep litter (Shanmathy *et al.* 2018). Higher growth performance has positive effects on the carcass attributes leading to better carcass yields and profits. Therefore, this study was conducted to compare the carcass characteristics of indigenous Siruvidai, Kadaknath and Nandanam Broiler-3 chicken at 16 weeks of age under cage system of management.

MATERIALS AND METHODS

The present study utilized twenty-four birds (12 males + 12 females) each of indigenous Siruvidai, Kadaknath and Nandanam Broiler-3 chickens reared under cage system of management fed with brooder diet containing 2500 ME kcal/kg ME and 18 % CP upto 12 weeks of age and grower diet containing 2300 ME kcal/kg ME and 14% CP thereafter upto 16 weeks of age. Scalding, defeathering and evisceration were carried out as per standard procedure (Lesson and Summers, 1980). The parameters recorded during the study were pre-slaughter weight New York dressed, eviscerated and ready-to-cook carcass weights (Arumugam and Panda, 1970) using a weighing balance of 0.1g accuracy and their percentages were calculated based on the live weight. The processing losses due to blood, shank, head and abdominal fat were also measured in all the three genotypes.

The cut-up parts, namely neck, breast, back, thigh, drumstick and wing along with giblets were weighed using a weighing balance of 0.1g accuracy and their percentage was calculated based on ready-to-cook weight.

Relative organ weight

The giblets (gizzard, heart and liver), small intestine and large intestines were cleaned and weighed separately. The relative organ weights were calculated on the per cent live weight (pre-slaughter) basis as follows.

Relative intestinal length

The lengths of small and large intestines were measured using the meter scale in all the three genotypes under the study, and relative intestinal length were calculated on the pre-slaughter live weight.

Statistical analysis

The data collected were statistically analyzed as per standard methods (Snedecor and Cochran, 1989) using the software SPSS (Version 24.0).

RESULTS AND DISCUSSION

The processing yields and losses of all the three genetic groups recorded in the study is presented in Table 1.

Processing yields

The sex-separate mean values of live body weight showed significant ($P<0.01$) difference among each other. The male Nandanam Broiler-3 birds have recorded significantly ($P<0.05$) higher pre-slaughter body weight (2408.33 g) at 16 weeks of age in comparison Kadaknath (1031g) and indigenous Siruvidai (1004.67 g) chicken. These findings are comparable to those reported by Deng *et al.* (2022) for Arbor Acres broilers (2652.42 g) at 75 days of

age, but considerably higher than that those of Mahuang (1814.46 g) and Tuer (1648.34 g) chicken. However, the pre-slaughter weights observed in our study for indigenous Siruvidai and Kadaknath chicken are lower than those reported by Vasanthi *et al.*, 2023 for indigenous Siruvidai chicken (916.10g) and by Gandhimathi, 2024 for farm-reared Siruvidai chicken (1560.33 g) at 16 weeks of age.

The overall mean New York dressed yield was significantly ($P<0.05$) higher in Nandanam Broiler-3 (91.60%) followed by indigenous Siruvidai (90.94%) and Kadaknath (89.98%) chicken. The sex-separate mean values differed significantly ($P<0.01$) from each other. Significantly ($P<0.05$) highest New York dressed yield was recorded in male Nandanam Broiler-3 (91.98 %) chicken compared to other types of chicken. These findings are comparable to those reported by Yuan *et al.* (2022) for Xueshan chicken (91.21% at 90 days and 90.72% at 100 days). In indigenous Siruvidai chicken, Balamurugan *et al.* (2024) and Vasanthi *et al.* (2023) observed similar value of 90.43 and 89.67 % and Nirosha (2024) recorded slightly higher value of 92.00%.

Nandanam Broiler-3 chicken had the significantly ($P<0.05$) higher overall mean eviscerated carcass yield (73.14 %) than indigenous Siruvidai (70.55%) followed by Kadaknath chicken (68.59%). The sex-separate mean values differed significantly ($P<0.01$) from each other. Significantly ($P<0.05$) highest eviscerated carcass yield was recorded in males of Nandanam Broiler-3 (73.41%) compared to other

types of chicken. These results are higher than those reported by Wang *et al.* (2009) for Gushi chicken (69.88 % for free-range and 69.90 % for indoor) and Vasanthi *et al.* (2023) for indigenous Siruvidai chickens (63.94%). However, the recorded values are lower than the findings of Deng *et al.* (2022) for Arbor Acres broilers (71.36%). The differences in eviscerated carcass yield could be due to variations in breed, age at slaughter and nutritional management.

The overall mean ready-to-cook yield was significantly ($P<0.05$) higher in the order of the Nandanam Broiler-3 (76.79 %) followed by indigenous Siruvidai (75.09 %) and Kadaknath (73.34 %) chicken. The sex-separate mean values varied significantly ($P<0.01$) from each other. Significantly ($P<0.05$) higher ready-to-cook yield was observed in males of Nandanam Broiler-3 (76.94 %) compared to other chicken types. These findings are higher than 69.62% reported by Vasanthi *et al.* (2023) and 70.64% by Balamurugan *et al.* (2024) but lower than 77.04% recorded by Nirosha (2024) for indigenous Siruvidai chicken. The variations in ready-to-cook yield could be attributed to differences in genetic background, age at slaughter and management practices.

Processing losses

The per cent blood loss was 2.92% in Nandanam Broiler-3 chicken which was significantly ($P<0.05$) higher in comparison to 2.46 % and 2.39 % recorded in indigenous Siruvidai and Kadaknath chickens. The sex-separate values differed significantly ($P<0.01$) from each other. Male Nandanam

Broiler-3 chicken recorded significantly ($P<0.05$) highest blood loss as 3.47 %. These findings are lower than those reported by Vasanthi *et al.* 2023 for indigenous Siruvidai chicken (3.92 %).

The per cent feather loss was significantly ($P<0.01$) different among all three genotypes, with Kadaknath having the highest value (7.63%), followed by indigenous Siruvidai (6.59%) and Nandanam Broiler-3 chicken (5.48 %). The sex-separate values differed significantly ($P<0.01$) from each other. Significantly ($P<0.05$) highest feather loss was recorded in males and females of Kadaknath breed of chicken. These results are comparable to those reported by Vasanthi *et al.* (2023) for indigenous Siruvidai chickens (6.41 %). The higher feather loss in indigenous breeds could be attributed to their denser plumage with long primaries, secondaries and sickle feathers compared to meat type birds.

The per cent head loss was significantly ($P<0.01$) different among all three genotypes, with Kadaknath having the highest value (4.76%), followed by indigenous Siruvidai (4.34%) and Nandanam Broiler-3 chicken (3.39%). These findings are lower than those reported by Gandhimathi, 2024 for free-range (3.99%) and farm-reared (5.01%) Siruvidai chickens. The high per cent head loss in indigenous Siruvidai chicken could be due to well-developed comb and wattles (Churchil *et al.*, 2023b) compared to meat type birds.

The per cent feet loss was significantly ($P<0.05$) higher in Kadaknath

(5.00%) compared to indigenous Siruvidai (4.48 %) and Nandanam Broiler-3 chicken (4.13 %). These results are higher than those reported by Gandhimathi, 2024 for free-range (3.68 %) and farm-reared (3.47 %) Siruvidai chickens. The higher percentage of feet loss in indigenous breeds could be attributed to longer shank in these types of chicken as adaptive character for escaping from predation.

The per cent viscera loss did not differ significantly ($P>0.05$) among the three genotypes, with values of 11.63, 11.58, and 10.95 % for Kadaknath, indigenous Siruvidai and Nandanam Broiler-3 chicken, respectively. These values are lower than those reported by Gandhimathi, 2024) for free-range (14.20%) and farm-reared (12.38 %) Siruvidai chicken. The variations in viscera loss could be due to differences in digestive tract development and abdominal fat deposition among different breeds.

The abdominal fat percentage was significantly ($P<0.05$) higher in Nandanam Broiler-3 (0.91 %) and indigenous Siruvidai (0.67%) compared to Kadaknath birds (0.20%). These results are lower than those reported by Wang *et al.* (2009) for Gushi chicken (3.01 % for free-range and 6.50 % for indoor) and Reddy *et al.* (2021) for Rajasri (1.5%), Vanaraja (2.3%) and broiler chickens (2.5%). The lower abdominal fat percentage in the present study could be attributed to differences in genetic makeup with indigenous birds having less tendency to deposit fat at early part of their life compared to meat type birds.

Cut-up part carcass yields

The cut-up part carcass yields of indigenous Siruvidai, Kadaknath and Nandanam Broiler-3 chicken are presented in Table 2. The per cent neck yield was significantly ($P<0.05$) higher in Kadaknath (10.29 %) compared to Nandanam Broiler-3 (9.36 %) and indigenous Siruvidai chicken (9.11 %). These findings are comparable to 10.02 % reported by Yuan *et al.* (2022) for Xueshan chicken at 90 days of age. However, Balamurugan *et al.* (2024) observed lower value of 6.41 % in indigenous Siruvidai chicken.

The per cent breast yield did not differ significantly ($P>0.05$) among the three genotypes with values of 25.78, 25.57 and 25.28% for Nandanam Broiler-3, indigenous Siruvidai and Kadaknath chicken respectively. These results are higher than those reported by Wang *et al.* (2009) for Gushi chicken (20.17 % for free-range and 17.44 % for indoor) and Balakumar (2022) for Kadaknath chicken (19.70%). The values are comparable to the observation of Balamurugan *et al.* (2024) in indigenous Siruvidai chicken (24.68 %).

The per cent back yield was significantly ($P<0.05$) lower in Kadaknath (17.54 %) compared to Nandanam Broiler-3 (20.5%) and indigenous Siruvidai chicken (19.38%). These findings are comparable to those reported by Reddy *et al.* (2021) for Rajasri (20.90%) and Vanaraja (19.76 %) chicken. However, Balamurugan *et al.* (2024) observed higher value of 24.74 % in indigenous Siruvidai chicken.

The per cent thigh yield differed significantly ($P < 0.01$) among the three genotypes, with indigenous Siruvidai chicken having the highest value (14.29 %), followed by Nandanam Broiler-3 (12.61 %) and Kadaknath (11.62 %). These results are lower than those reported by Wang *et al.* (2009) for Gushi chicken (27.65 % for free-range and 26.68 % for indoor). The high thigh yield could be attributed to the long legs of indigenous Siruvidai chicken (Churchil *et al.*, 2023b) developed as an adaptive attribute in free range conditions.

The overall mean drumstick yield was significantly ($P < 0.05$) higher in Kadaknath (16.87%) compared to Nandanam Broiler-3 (16.44%) and indigenous Siruvidai chicken (15.6%). These findings are comparable to those reported by Reddy *et al.* (2021) for broiler chicken (16.77%) but higher than their observations for Rajasri (13.45 %) and Vanaraja (15.81%) chickens and similar to the value of 16.31 % recorded by Balamurugan *et al.* (2024) for indigenous Siruvidai chicken.

The overall mean wing yield was significantly ($P < 0.05$) higher in Kadaknath (11.73 %) compared to Nandanam Broiler-3 (10.56 %) and indigenous Siruvidai chicken (10.01 %). These values are lower than those reported by Reddy *et al.* (2021) for Rajasri (12.93 %) and Vanaraja (13.73 %) chickens and Balamurugan *et al.* (2024) in indigenous Siruvidai chicken (12.47 %).

Relative organ weights

The relative weights and lengths of different internal organs of indigenous

Siruvidai, Kadaknath and Nandanam Broiler-3 chicken are presented in Table 3.

The per cent heart yield was indigenous significantly ($P < 0.05$) higher in Siruvidai (0.49 %) compared to Kadaknath chicken (0.43 %); while, that of Nandanam Broiler-3 (0.44 %) did not differ significantly from either. These results are comparable to those reported by Auza *et al.* (2021) for native Indonesian chicken (0.38 %).

The per cent liver yield was significantly ($P < 0.01$) higher in indigenous Siruvidai (1.84 %) and Kadaknath chicken (1.82 %) compared to Nandanam Broiler-3 chicken (1.37 %). These findings are comparable to those reported by Auza *et al.* (2021) for native Indonesian chicken (1.94 %) but lower than the observations of Vasanthi *et al.* 2023 for indigenous Siruvidai chicken (2.93 %).

The per cent gizzard yield was significantly ($P < 0.01$) different among all three genotypes with Kadaknath chicken having the highest value (2.51 %), followed by indigenous Siruvidai (2.20 %) and Nandanam Broiler-3 chicken (1.84%). These results are comparable to those reported by Auza *et al.* (2021) for native Indonesian chickens (2.65 %) and Vasanthi *et al.* (2023) for indigenous Siruvidai chickens (2.35 %).

The per cent spleen yield was significantly ($P < 0.01$) higher in indigenous Siruvidai (0.19 %) compared to Nandanam Broiler-3 (0.14 %) chicken, while Kadaknath chicken (0.16 %) did not differ significantly from either. These findings are comparable

to those reported by Auza *et al.* (2021) for native Indonesian chicken (0.16 %).

The per cent giblets yield was significantly ($P<0.01$) different among the three genotypes, with Kadaknath chicken having the highest value (6.67 %), followed by indigenous Siruvidai (6.04%) and Nandanam Broiler-3 chicken (4.76%). These findings are higher than those reported by Reddy *et al.* (2021) for Rajasri (3.11 %), Vanaraja (3.19 %), and broilers (3.91 %) and Balamurugan *et al.* (2024) for indigenous Siruvidai chicken (4.54 %), but comparable to the observations of Vasanthi *et al.* (2023) for indigenous Siruvidai chicken (5.67 %).

Relative intestinal length and weight

The relative total intestine length was significantly ($P<0.01$) higher in indigenous Kadaknath chicken (13.44 %) and Siruvidai (13.42 %) compared to Nandanam Broiler-3 chicken (8.09 %). These findings are higher than those reported by (Gandhimathi, 2024) for free-range (10.14 %) and farm-reared (7.24 %) Siruvidai chickens.

The overall mean total intestine weight percentage was significantly ($P<0.01$) higher in indigenous Siruvidai (2.67%) and Kadaknath (2.67%) chicken compared to Nandanam Broiler-3 chicken (2.20%). These results are comparable to those reported by Auza *et al.* (2021) for native Indonesian chicken (2.20 % for small intestine).

Intestinal weight

The variations in relative organ weights and intestinal measurements across studies could be attributed to differences in genetic makeup, age at slaughter, nutritional management and environmental factors. Indigenous breeds generally showed higher relative organ weights and intestinal measurements compared to commercial broilers, which could be related to their slower growth rate and adaptation to diverse feeding conditions.

CONCLUSION

It can be concluded that Nandanam Broiler-3, a coloured broiler chicken has demonstrated superior performance in terms of processing yields compared to indigenous breeds of Siruvidai and Kadaknath chicken. The conformation of indigenous breeds of chicken having well developed plumage, comb and wattles resulted in more processing loss in terms of feathers and head. The long legs of Siruvidai chicken as an adaptive trait to the free-range conditions resulted in more processing loss of feet and higher yield of thigh cut-up parts portion. The indigenous chickens have more bony portions of neck, drumstick and wing compared to Nandanam Broiler-3 chicken. Higher giblets yield and relative intestinal measurements in indigenous breeds compared to Nandanam Broiler-3, suggest better adaptability to diverse feeding conditions. The lower abdominal fat percentage in indigenous breeds, particularly in Kadaknath, suggests their potential for producing leaner meat compared to commercial broilers.

Table.1. Processing yields and losses of indigenous Siruvudai, Kadaknath and Nandanam Broiler-3 chickens at 16 weeks of age

Parameters	Indigenous Siruvudai		Kadaknath		Nandanam Broiler - 3		F-value	Overall			
	Male (n=12)	Female (n=12)	Male (n=12)	Female (n=12)	Male (n=12)	Female (n=12)		Indigenous Siruvudai (n=24)	Kadaknath (n=24)	Nandanam Broiler-3 (n=24)	F-value
	Live body weight	1004.67 ^c ±27.59	783.50 ^d ±32.05	1031.00 ^c ±28.81	838.17 ^d ±29.01	2408.33 ^a ±49.79		1873.83 ^b ±48.03	319.30 ^{**}	894.08 ^B ±30.97	934.58 ^B ±28.35
Processing yields %											
New York dressed %	90.74 ^b ±0.41	91.15 ^{ab} ±0.40	89.74 ^c ±0.30	90.22 ^{bc} ±0.34	91.98 ^a ±0.27	91.22 ^{ab} ±0.25	5.72 ^{**}	90.94 ^A ±0.28	89.98 ^B ±0.22	91.60 ^A ±0.2	11.848 ^{**}
Eviscerated carcass weight%	70.2 ^b ±0.33	70.91 ^b ±0.38	68.49 ^c ±0.57	68.69 ^c ±0.33	73.41 ^a ±0.45	72.87 ^a ±0.43	23.70 ^{**}	70.55 ^B ±0.26	68.59 ^C ±0.32	73.14 ^A ±0.31	58.633 ^{**}
Ready to cook %	74.6 ^d ±0.32	75.57 ^{bc} ±0.39	73.13 ^c ±0.54	73.56 ^{de} ±0.31	76.94 ^a ±0.43	76.64 ^{ab} ±0.39	15.23 ^{**}	75.09 ^B ±0.27	73.34 ^C ±0.31	76.79 ^A ±0.29	35.8 ^{**}
Processing losses %											
Blood %	2.54 ^b ±0.19	2.39 ^b ±0.20	2.62 ^b ±0.24	2.17 ^b ±0.32	3.47 ^a ±0.11	2.38 ^{ab} ±0.14	4.62 ^{**}	2.46 ^B ±0.14	2.39 ^B ±0.20	2.92 ^A ±0.14	3.095 ^{**}
Feather %	6.72 ^{ab} ±0.51	6.47 ^{ab} ±0.43	7.65 ^a ±0.41	7.61 ^a ±0.33	4.55 ^c ±0.26	6.40 ^b ±0.33	8.56 ^{**}	6.59 ^B ±0.33	7.63 ^A ±0.26	5.48 ^C ±0.28	13.783 ^{**}
Head %	4.28 ^b ±0.11	4.39 ^b ±0.16	4.64 ^{ab} ±0.16	4.87 ^a ±0.23	3.64 ^c ±0.11	3.13 ^d ±0.09	18.36 ^{**}	4.34 ^B ±0.10	4.76 ^A ±0.14	3.39 ^C ±0.09	40.162 ^{**}
Feat %	4.58 ^b ±0.19	4.38 ^b ±0.22	5.37 ^a ±0.17	4.62 ^b ±0.18	4.47 ^b ±0.20	3.78 ^c ±0.09	7.88 ^{**}	4.48 ^B ±0.15	5.00 ^A ±0.14	4.13 ^B ±0.13	9.728 ^{**}
Viscera %	11.68 ^a ±0.41	11.48 ^{ab} ±0.15	11.23 ^{ab} ±0.35	12.03 ^a ±0.43	10.46 ^b ±0.33	11.44 ^{ab} ±0.30	2.37 [*]	11.58 ±0.21	11.63 ±0.28	10.95 ±0.24	2.322NS
Abdominal fat%	0.54 ^{bc} ±0.15	0.81 ^b ±0.20	0.16 ^c ±0.06	0.24 ^c ±0.10	0.25 ^c ±0.09	1.57 ^a ±0.20	13.98 ^{**}	0.67 ^A ±0.12	0.20 ^B ±0.06	0.91 ^A ±0.17	7.985 ^{**}

**Significant (P<0.01); * Significant (P < 0.05); NS – Not significant

abc - Sex-separate means of three genetic groups bearing different superscripts within a row differ significantly (P<0.05)

ABCD - Overall mean values of three genetic groups bearing different superscripts within a row differ significantly (P<0.05)

Table 2. Cut-up part carcass yields (%) of indigenous Siruvidai, Kadaknath and Nandanam Broiler-3 chicken at 16 weeks of age

Name of the part	Indigenous Siruvidai		Kadaknath		Nandanam Broiler – 3		F-value	Overall			
	Male (n=12)	Female (n=12)	Male (n=12)	Female (n=12)	Male (n=12)	Female (n=12)		Indigenous Siruvidai (n=24)	Kadaknath (n=24)	Nandanam Broiler-3 (n=24)	F-value
Cut-up parts											
Neck	9.04 ^{cd} ±0.37	9.19 ^{bcd} ±0.34	10.18 ^{ab} ±0.47	10.40 ^a ±0.29	10.02 ^{abc} ±0.37	8.69 ^d ±0.28	9.11 ^B ±0.25	10.29 ^A ±0.27	9.36 ^B ±0.26	3.85 ^{**}	5.663 ^{**}
Breast	23.83 ^c ±0.66	27.32 ^a ±0.66	24.84 ^{bc} ±0.48	25.72 ^{ab} ±0.61	24.84 ^{bc} ±0.62	26.73 ^a ±0.30	25.57 ±0.58	25.28 ±0.39	25.78 ±0.39	5.24 ^{**}	0.296 ^{NS}
Back	19.36 ^{ab} ±0.7	19.39 ^{ab} ±0.69	17.77 ^b ±0.74	17.31 ^b ±0.74	19.97 ^a ±0.69	21.04 ^a ±0.58	19.38 ^A ±0.48	17.54 ^B ±0.52	20.5 ^A ±0.45	4.02 ^{**}	9.561 ^{**}
Thigh	14.91 ^a ±0.47	13.68 ^{ab} ±0.46	10.92 ^c ±0.59	12.33 ^b ±0.40	12.82 ^b ±0.37	12.39 ^b ±0.35	14.29 ^A ±0.34	11.62 ^C ±0.38	12.61 ^B ±0.25	9.13 ^{**}	16.721 ^{**}
Drumstick	16.16 ^{bc} ±0.32	15.03 ^c ±0.39	17.54 ^a ±0.45	16.2 ^{bc} ±0.57	17.21 ^{ab} ±0.37	15.66 ^c ±0.23	15.6 ^C ±0.27	16.87 ^A ±0.38	16.44 ^{AB} ±0.27	5.41 ^{**}	4.274 ^{**}
Wing	10.80 ^b ±0.31	9.21 ^c ±0.38	12.04 ^a ±0.19	11.43 ^{ab} ±0.37	10.54 ^b ±0.22	10.57 ^b ±0.23	10.01 ^B ±0.29	11.73 ^A ±0.21	10.56 ^B ±0.16	10.53 ^{**}	14.927 ^{**}

**Significant (P<0.01);

a, b, c, d- Sex-separate mean values of three genotypes bearing different superscripts within a row differ significantly (P<0.05)

A, B, C - Overall mean values of three types of chicken bearing different superscripts within a row differ significantly (P<0.05)

Table. 3 Relative organ weight (%) and relative intestinal length (%) of indigenous Sirividai, Kadaknath and Nandanam Broiler-3 chicken at 16 weeks age.

Nam of the Organ	Indigenous Sirividai				Kadaknath				Nandanam Broiler - 3		F-value	Overall			
	Male (n=12)		Female (n=12)		Male (n=12)		Female (n=12)		Male (n=12)	Female (n=12)		Indigenous Sirividai (n=24)	Kadaknath (n=24)	Nandanam Broiler-3 (n=24)	F-value
Relative organ weights															
Giblets	5.90 ^b ±0.17	6.18 ^{ab} ±0.19	6.73 ^a ±0.38	6.62 ^a ±0.18	4.59 ^c ±0.12	4.92 ^c ±0.12	6.04 ^b ±0.13	6.67 ^a ±0.21	4.76 ^c ±0.09	42.391**					
Heart	0.49 ±0.02	0.50 ±0.06	0.44 ±0.01	0.42 ±0.02	0.46 ±0.01	0.42 ±0.01	0.49 ^a ±0.03	0.43 ^b ±0.01	0.44 ^{ab} ±0.01	2.884**					
Liver	1.80 ^a ±0.06	1.88 ^a ±0.08	1.74 ^a ±0.07	1.89 ^a ±0.09	1.32 ^b ±0.02	1.42 ^b ±0.05	1.84 ^a ±0.05	1.82 ^a ±0.06	1.37 ^b ±0.03	33.122**					
Gizzard	2.11 ^{cd} ±0.09	2.29 ^{bc} ±0.08	2.46 ^{ab} ±0.08	2.56 ^a ±0.09	1.76 ^c ±0.08	1.93 ^{de} ±0.06	2.20 ^b ±0.06	2.51 ^a ±0.06	1.84 ^c ±0.05	34.05**					
Spleen	0.16 ^{cb} ±0.02	0.21 ^a ±0.03	0.15 ^b ±0.01	0.17 ^{ab} ±0.02	0.13 ^b ±0.01	0.15 ^b ±0.01	0.19 ^a ±0.02	0.16 ^{ab} ±0.01	0.14 ^b ±0.01	3.487**					
Relative intestinal length															
Large intestine length	1.73 ^c ±0.09	2.29 ^a ±0.11	1.98 ^b ±0.08	2.31 ^a ±0.09	1.07 ^d ±0.05	1.30 ^d ±0.05	2.01 ^a ±0.09	2.15 ^a ±0.07	1.18 ^b ±0.04	55.502**					
Small intestine length	10.08 ^b ±0.29	12.73 ^a ±0.57	10.20 ^b ±0.67	12.39 ^a ±0.34	6.35 ^c ±0.18	7.47 ^c ±0.28	11.4 ^a ±0.42	11.30 ^a ±0.43	6.91 ^b ±0.20	49.377**					
Total intestine length	11.82 ^b ±0.34	15.02 ^a ±0.66	12.19 ^b ±0.67	14.7 ^a ±0.37	7.41 ^d ±0.21	8.76 ^c ±0.32	13.42 ^a ±0.49	13.44 ^a ±0.46	8.09 ^b ±0.23	56.315**					
Small intestine weight	2.09 ^a ±0.09	2.07 ^a ±0.08	1.99 ^{ab} ±0.06	2.01 ^{ab} ±0.06	1.56 ^c ±0.06	1.82 ^b ±0.10	2.08 ^a ±0.06	2.00 ^a ±0.04	1.69 ^b ±0.06	14.437**					
Large intestine weight	0.56 ^{bc} ±0.04	0.62 ^{ab} ±0.03	0.64 ^{ab} ±0.03	0.70 ^a ±0.03	0.50 ^c ±0.03	0.52 ^c ±0.03	0.59 ^b ±0.02	0.67 ^a ±0.02	0.51 ^c ±0.02	12.821**					
Total intestine weight	2.65 ^a ±0.11	2.69 ^a ±0.10	2.63 ^a ±0.09	2.70 ^a ±0.06	2.06 ^b ±0.09	2.34 ^c ±0.12	2.67 ^a ±0.07	2.67 ^a ±0.06	2.20 ^b ±0.08	15.414**					

**Significant (P<0.01), * Significant (P<0.05); NS – Not significant, abc - Sex-separate means values of four types of chicken bearing different superscripts within a row differ significantly (P<0.05);

ABCD - Overall mean values of three types of chicken bearing different superscripts within a row differ significantly (P<0.05)

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