



Comparison of growth traits and carcass yield of Kuttanad and White Pekin ducks[#]

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Abstract

The study was conducted to compare the growth and carcass traits of Kuttanad [unselected (UKD) and improved meat line (IKD)] and White Pekin ducks (WPD). One hundred and twenty five day-old ducklings from each group were selected, wing banded and reared under uniform conditions by providing ad-libitum feed (22 per cent CP and 2800 Kcal/kg M.E) and water for 10 weeks. Fortnightly body weight, body weight gain, feed consumption and feed conversion ratio were calculated. Carcass traits like slaughter weight, carcass weight and dressing percentage (with and without giblets) were studied in eight birds of each group at 6, 8 and 10 weeks of age. Fortnightly body weight and body weight gain was found to be significantly ($p < 0.05$) high in WPD, except during first fortnight where IKD showed significantly ($p < 0.05$) higher body weight gain. The FCR was found to be better in WPD followed by IKD and UKD. The mean slaughter weight and carcass weight were significantly ($p < 0.05$) high in WPD at 8 and 10 weeks of age. Dressing percentage (with and without giblets) in UKD and IKD were significantly ($p < 0.05$) high at eight weeks whereas that of WPD at 10 weeks of age. White Pekin showed better values in growth traits and carcass yield than Kuttanad ducks. However, no significant difference was obtained between the traits of unselected and improved flocks of Kuttanad ducks.

Keywords: Kuttanad ducks, White Pekin ducks, growth traits, carcass yield

Duck rearing is a nascent animal husbandry sector with significant research and production prospects when compared to chicken in the country. Duck meat is comparable to chicken meat and is a good source of protein, minerals and other compounds as well. Kuttanad ducks are dual purpose indigenous ducks of Kerala that are acclimatised to the local climate. Presently these

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ducks are reared mainly for egg production. In order to explore the meat production potential of Kuttanad ducks, selection and breeding studies were initiated at the University Poultry and Duck farm, Mannuthy (Cyriac, 2016). In Kerala, exotic breeds like White Pekin and its crosses are used mainly for meat purpose. The comparison of growth performance, feed conversion ratio and carcass characteristics of two groups of Kuttanad ducks (unselected flock and the improved meat line) with White Pekin ducks will help to assess the improvement made so far and to design further research. Hence, the present study was designed with the objectives of comparing the growth traits and carcass yield in Kuttanad (unselected flocks and improved meat line) and White Pekin ducks.

Materials and methods

Experimental birds

The study was conducted at Avian Research Station, Thiruvazhamkunnu under Kerala Veterinary and Animal Sciences University. One hundred and twenty five, day-old ducklings each belonging to unselected flock of Kuttanad ducks (UKD), improved meat line of Kuttanad ducks (IKD) and White Pekin ducks (WPD) were utilised for the study. Each duck was wing banded and vaccinated against duck cholera and duck plague at four and eight weeks of age, respectively. The ducklings were reared under uniform management conditions with *ad libitum* feed [22 % CP and 2800 ME (kcal/kg)] and water in slat system for 10 weeks.

The body weight and mean daily feed consumption at every fortnight were

recorded. The fortnightly body weight gain and cumulative FCR for 6, 8 and 10 weeks of age were calculated. Eight birds from each group were randomly selected for slaughter at 6, 8 and 10 weeks of age. The following measurements were taken during the slaughter studies *viz*; slaughter weight, carcass weight and dressing percentage (with and without giblets). Body weight of ducks prior to slaughter was taken as the slaughter weight and weight of ducks after removal of blood, feathers, head, feet and viscera was taken as the carcass weight and expressed in grams. Dressing percentage with and without giblets was recorded as the percentage weight of carcass and giblets with respect to the slaughter weight. Data collected on various parameters were statistically analysed by using SPSS version 24.0.

Results and discussion

Body weight and body weight gain

The data on fortnightly body weight and body weight gain are presented in Table 1 and 2. The results of present experiment revealed that the fortnightly these values are higher for White Pekin ducks than the two groups of Kuttanad ducks except during the first fortnight period where the improved meat line of Kuttanad ducks showed significantly ($p < 0.05$) higher body weight gain than the other groups of ducks. The mean body weight of Kuttanad ducks observed during the first fortnight in the present study was higher than the findings of NATP (2004), but was similar to the body weight of S2 generation Kuttanad ducks reported by Cyriac (2016). In the subsequent ages, findings on body weight of UKD and IKD were lower than NATP (2004), Cyriac (2016) and Jeny *et al.* (2017). The mean body weight recorded for

Table 1. Mean $\pm$ SE body weight at fortnightly intervals in three groups of ducks, g

Age (in weeks)	UKD		IKD		WPD	
	n	Body wt.	n	Body wt.	n	Body wt.
0	125	39.89 ^b $\pm$ 0.26	125	39.36 ^b $\pm$ 0.31	125	62.28 ^a $\pm$ 0.84
2	125	147.24 ^b $\pm$ 2.51	120	156.14 ^b $\pm$ 3.00	121	169.93 ^a $\pm$ 3.97
4	118	342.35 ^{ba} $\pm$ 7.75	112	348.65 ^b $\pm$ 9.19	108	443.81 ^a $\pm$ 13.12
6	115	567.06 ^b $\pm$ 13.86	105	575.57 ^b $\pm$ 14.11	108	861.78 ^a $\pm$ 23.26
8	104	850.33 ^b $\pm$ 20.27	96	873.77 ^b $\pm$ 21.22	100	1394.82 ^a $\pm$ 35.30
10	96	1117.42 ^b $\pm$ 24.59	88	1143.88 ^b $\pm$ 29.28	92	1793.53 ^a $\pm$ 46.79

(a, b) Means bearing different superscripts in a row differ significantly ($p < 0.05$)

White Pekin ducks were higher for Mazanowski *et al.* (2003), Heo *et al.* (2015), Kokoszynski *et al.* (2019) and Rabbani *et al.* (2019) than the present findings. Lower body weight of the Kuttanad and White Pekin ducks in the present findings than the other studies might be due to the lower M.E (kcal/kg) value of the feed given in this study. The pattern of growth rate and mean body weight gain values of UKD and IKD in this study is in agreement with the results of NATP (2004) in Kuttanad ducks of all ages. From this study, it was also inferred that the highest body weight gain in Kuttanad and White Pekin ducks was observed between seven and eight weeks of age.

Feed consumption and feed conversion ratio (FCR)

The results of mean daily feed consumption and cumulative FCR are featured in Table 3 and 4, respectively. In the two groups of Kuttanad ducks, the average daily feed consumption was more or less similar at every fortnight. With the exception of the first fortnight, WPD had a higher feed intake than Kuttanad ducks at all other age groups. The average daily feed consumption of two flocks of Kuttanad ducks in this study is in agreement with the findings of NATP (2004) and Cyriac (2016) in Kuttanad ducks up to 10 weeks of age.

White Pekin ducks had the highest cumulative FCR, followed by improved meat line of Kuttanad ducks and then the unselected flock. In this study, better cumulative FCR was recorded in two groups of Kuttanad ducks at zero to eight weeks and 0 to 10 weeks when compared to the study of Cyriac (2016) in Kuttanad ducks. The cumulative FCR of White

Pekin ducks at 0 to 8 weeks was found to be better than that reported by Kokoszynski *et al.* (2019) and Rabbani *et al.* (2019) in Pekin ducks.

Slaughter weight and carcass weight

The results on slaughter weight and carcass weight are presented in Table 5 and 6, respectively. At 8 and 10 weeks of age, the mean slaughter weight and carcass weight of WPD were significantly ($p < 0.05$) higher than the other groups and the yield was statistically similar in UKD and IKD. The average slaughter weight in unselected flock of Kuttanad ducks at all ages was similar to that of Cyriac (2016) and Sapkota *et al.* (2009), but greater than that of Cyriac *et al.* (2014) and Kolluri *et al.* (2015). The average slaughter weight of the Kuttanad ducks in the present study were lower than that reported by Sangilimadan *et al.* (2001) in desi spent ducks.

Dressing percentage (with and without giblets)

Dressing percentage with and without giblets in three groups of ducks did not differ significantly at six weeks of age. At eight weeks of age, significantly ($p < 0.05$) higher dressing percentage (with and without giblets) was observed in two groups of Kuttanad ducks compared to White Pekin ducks. This might be due to the high yield of giblets and low yield of feathers in Kuttanad ducks when compared to the White Pekin ducks at same age irrespective of the weight. But at 10 weeks of age, White Pekin ducks showed significantly ($p < 0.05$) higher dressing percentage (with and without giblets) than Kuttanad ducks. The present

Table 2. Mean $\pm$ SE body weight gain at fortnightly intervals in three groups of ducks, g

Age (in weeks)	UKD		IKD		WPD	
	n	Body weight gain	n	Body weight gain	n	Body weight gain
0 - 2	125	107.35 ^b $\pm$ 2.45	120	116.74 ^a $\pm$ 2.93	121	107.23 ^b $\pm$ 3.55
3 - 4	118	191.62 ^b $\pm$ 6.44	112	190.15 ^b $\pm$ 7.16	108	265.37 ^a $\pm$ 10.48
5 - 6	115	220.01 ^b $\pm$ 8.41	105	217.54 ^b $\pm$ 8.41	108	417.97 ^a $\pm$ 12.50
7 - 8	104	276.67 ^b $\pm$ 9.22	96	300.01 ^b $\pm$ 10.45	100	513.15 ^a $\pm$ 15.46
9 - 10	96	266.20 ^b $\pm$ 7.66	88	274.10 ^b $\pm$ 15.34	92	410.16 ^a $\pm$ 15.64

(a, b) Means bearing different superscripts in a row differ significantly ($p < 0.05$)

Table 3. Mean daily feed consumption up to 10 weeks of age in three groups of ducks, g

Age (in weeks)	UKD	IKD	WPD
0 - 2	27.38	25.67	27.23
3 - 4	50.33	49.94	64.10
5 - 6	73.72	75.64	125.36
7 - 8	92.06	87.17	142.52
9 - 10	133.89	133.15	179.88

Table 4. Cumulative Feed Conversion Ratio in three groups of ducks

Age (in weeks)	UKD	IKD	WPD
0 - 6	3.97	3.90	3.62
0 - 8	4.17	3.97	3.67
0 - 10	4.87	4.68	4.17

Table 5. Mean ($\pm$ SE) slaughter weight and carcass weight at 6, 8 and 10 weeks of age in three groups of ducks, g

Age (in weeks)	Slaughter weight			Carcass weight		
	UKD	IKD	WPD	UKD	IKD	WPD
6	616.62 $\pm$ 42.66	620.00 $\pm$ 42.66	613.25 $\pm$ 68.25	406.12 $\pm$ 29.17	416.37 $\pm$ 20.40	400.50 $\pm$ 50.04
8	839.75 ^b $\pm$ 48.29	927.50 ^b $\pm$ 49.65	1614.12 ^a $\pm$ 116.15	586.00 ^b $\pm$ 35.54	646.37 ^b $\pm$ 31.54	1061.12 ^a $\pm$ 73.15
10	1405.75 ^b $\pm$ 35.98	1368.12 ^b $\pm$ 51.20	2324.25 ^a $\pm$ 118.61	983.00 ^b $\pm$ 22.11	961.87 ^b $\pm$ 35.08	1684.37 ^a $\pm$ 95.30

(a, b) Means bearing different superscripts in a row differ significantly ($p < 0.05$)

Table 6. Mean ($\pm$ SE) dressing percentage at 6, 8 and 10 weeks of age in three groups of ducks

Age (in weeks)	Dressing percentage (with giblets)			Dressing percentage (without giblets)		
	UKD n = 8	IKD n = 8	WPD n = 8	UKD n = 8	IKD n = 8	WPD n = 8
6	65.75 $\pm$ 0.42	67.09 $\pm$ 0.37	64.70 $\pm$ 1.48	57.58 $\pm$ 0.56	58.78 $\pm$ 0.43	55.19 $\pm$ 1.85
8	69.72 ^a $\pm$ 0.50	69.83 ^a $\pm$ 0.93	65.86 ^b $\pm$ 0.48	62.12 ^a $\pm$ 0.61	61.92 ^a $\pm$ 0.85	59.68 ^b $\pm$ 0.47
10	69.97 ^b $\pm$ 0.55	70.35 ^b $\pm$ 0.68	72.33 ^a $\pm$ 0.49	62.48 ^b $\pm$ 0.63	63.42 ^b $\pm$ 0.63	66.63 ^a $\pm$ 0.57

(a, b) Means bearing different superscripts in a row differ significantly ($p < 0.05$)

findings on dressing percentage of UKD and IKD at all ages were in agreement with the reports of Cyriac (2016), Ancy *et al.* (2018) and Kolluri *et al.* (2015). The dressing percentage observed in White Pekin ducks in this study was similar with the dressing percentages reported by Ancy *et al.* (2018), Kokoszynski *et al.* (2019) and Rabbani *et al.* (2019) in Pekin ducks at eight weeks of age.

Conclusion

Based on the results obtained in this comparative study, there was considerable increase in body weight gain during seven to eight weeks of age. Considering the body weight, body weight gain, slaughter weight and dressed percentage White Pekin ducks showed better performance when compared to the two

groups of Kuttanad ducks. Improved meat line of Kuttanad ducks showed better body weight and dressing percentage at 10 weeks of age and hence the ideal age of slaughter could be fixed as 10 weeks. From the results, it could be concluded that the meat production potential of Kuttanad ducks could be improved through the selection and breeding for over four generations. However, further research should be carried out for improving the FCR and slaughter age.

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Conflict of interest

The authors declare that they have no conflict of interest.

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