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RELATIONSHIP OF SEX, AGE, AND BODY WEIGHT TO LOCAL DUCK CARCASS YIELD

Sri Sudaryati, Heru Sasongko, Sri Harimurti[1]

ABSTRACT

The aim of this study was to examine the relationship of sex, age, and body weight (BW) to local duck carcass yield, expressed as carcass weight (g) and as a percentage of live BW (%). One hundred males and 100 females local duck of 8, 10, 12, 14 and 16 weeks of age were raised intensively and used to investigate the effect of sex, age, and BW on yield and percentage of live BW of various carcass components. During processing, weight of carcass and carcass components were measured. The data were subjected to analyses of variance to determine age and sex effect on absolute weight and as a percentage of live BW basis. Regression analyses were used to generate equations describing the relationship between carcass components and BW for each sex and with sexed combination. Yield of carcass and carcass components changed significantly by the increasing of age and BW ($P<.01$). In, general, male carcass yield and carcass components were larger than female, but in the contrary male's carcass yield and carcass components as a percentage of live BW were smaller than female's ($P<.01$). Carcass components of duck yield provided in different varieties by age and sex affected.

Key words: Age, Sex, Carcass components, Local duck

INTRODUCTION

Meat duck is well accepted in the worldwide society all aver the world. Duck is of great importance as the source of both meat and eggs. Duck are also able to consume available feed at the place they live on (Scott and Dean, 1991). In Indonesia, the quality of duck as one of poultry meat resources is not good enough. It is because duck, which were slaughtered commonly, came from infertile duck or the female, which is no longer productive as a layer or breeder or spent ducks.

Growth rate is influenced by sex, age, strain, and also feed (Scott and Dean, 1991). Sex differences in growth rate always happened in common duck. Mulyadi and Wihandoyo (1987) found that local duck body weight that are raised traditionally at 16 weeks of age reach 895,3 g for male and 793,4 g for female. This is similar with the research of Sudibyo (1984) that male body weight reach 1496,11 g and 1393,10 for female. It was quite obvious that growth of some of the component parts of the body was dependent upon strain and sex of poultry. Components of carcass yield were a function of strain and sex (Brake *et al.*, 1995). A number investigation showed that proportion of components carcasses have changed with the increasing of age and live BW. It was happened on Broiler (Brake *et al.*, 1993), on Turkey (Brake *et al.*, 1995), on Quail (Yalcin *et al.*, 1994). The yield of edible portion or offal from single or mixed-sex broiler differed due to body weight (Leeson and Summers, 1980).

The objective of the study was to want to know the effect of sex, age, and BW to local duck carcass yield and to develop regression equations that describe the general pattern for components of carcass yield of local duck as affected by sex and BW.

[1] Faculty of Animal Science, Gadjah Mada University, Yogyakarta, Indonesia

Table 1. Effect of Sex, Age, Body Weight on Local Duck Carcass

Age (Week)	Sex	Body Weight [1] (g)	Carcass (g)	(%)
8	Male	1,037.00	564.10	54.37
	Female	922.45	520.91	56.47
	Mean	979.98[a]	542.51[a]	55.36[a]
10	Male	1.207.95	681.80	56.44
	Female	1.141.90	649.69	56.90
	Mean	1.174.93[b]	665.75[b]	56.64[ab]
12	Male	1,255.40	698.60	55.65
	Female	1,162.90	665.18	57.72
	Mean	1,209.15[b]	681.89[bc]	56.39[ab]
14	Male	1, 306.10	751.40	57.53
	Female	1,164.75	690.10	59.25
	Mean	1.235.43[b]	720.75[c]	58.34[b]
16	Male	1.331.13	748.30	56.22
	Female	1.099.75	648.43	58.96
	Mean	1,215.44[b]	698.37[bc]	57.46[ab]
	SEM	20.46	6.76	0.74
	Age (A)	102.09**	2.99*	18.87**
	Sex (S)	52.82**	18.81**	14.32*
	A X S	1.26	0.12	1.70

[1] Deprived of feed for 14 hours
* P<.05, ** P<.01
Means for ages with no common superscripts differ significantly
MES Pooled standard error means

MATERIAL AND METHODS

One hundred local males and 100 local females day old duck were utilized in the study. All duck were raised in litter floor. Food and water were available *ad libitum*. The diet contained 230 g protein and 3.200 Koala/kg of energy were given for duck between 0 to 2 weeks of age and 160 g protein and 2.800 Kcal/kg of energy until the end of the study.

All ducks were weighed individually at 8, 10, 12, 14, and 16 weeks of age. Twenty males and 20 females duck were chosen randomly for carcass examination at each age. Those selected ducks were separated from other and feed was deprived from them for 14 hours before slaughtered. The ducks were 8, 10, 12, 14, and 16 weeks of age at slaughter.

Each duck was weighed live before slaughtered. Ducks were killed by severing the jugular vein followed bleeding time for a 4 minutes each duck was dipped in a water bath at 70 ^{0}C for 2 minutes and feathers were removed by hand. Removing the head and neck, shanks then processed the duck and feet, preen gland and were eviscerated manually by cutting around the vent and removing the viscera. After eviscerated weight of carcass had been obtained. Wings were removed by cutting through the shoulder joint at the proximal end of the *humerus*. Drumsticks were obtained by cutting at the joint between femur and *ileum*. The whole breast portion was obtained by cutting through the back and the remaining portion was thigh.

All data were expressed as a raw weight (g) and as a percentage of live BW, then analyzed by simple factorial with age and sex

Table 2. The effect of Age and Sex on Weight of Breast, Wing, Thigh, and Drumsticks

Age (weeks)	Sex	Breast		Wings		Thigh		Drumsticks	
		(g)	(%)	(g)	(%)	(g)	(%)	(g)	(%)
8	M	209.05	20.15	93.52	9.01	166.61	15.93	96.65	9.30
	F	187.77	20.35	88.08	9.55	153.37	16.63	91.70	9.45
	Mean	198.41^{a}	20.30^{a}	90.80^{a}	9.28^{a}	159.99^{a}	16.28^{b}	94.18^{bc}	9.63^{c}
10	M	279.89	23.18	111.72	9.25	190.16	15.31	102.42	8.49
	F	270.77	23.66	108.58	9.98	170.40	14.94	100.59	8.81
	Mean	275.03^{b}	23.42^{b}	110.15^{c}	9.62^{b}	180.28^{b}	15.13^{ab}	101.51^{c}	8.65^{b}
12	M	314.89	24.67	115.68	9.22	178.90	14.12	96.00	7.65
	F	312.85	26.92	104.40	8.98	160.55	13.81	87.39	7.51
	Mean	313.85^{c}	25.80^{c}	110.04^{c}	9.10^{a}	169.73^{ab}	13.97^{a}	91.70^{b}	7.58^{c}
14	M	331.52	25.38	116.47	8.92	203.72	15.61	94.47	7.23
	F	320.69	27.53	103.11	8.85	181.59	15.59	84.69	7.27
	Mean	317.68^{c}	26.46^{c}	109.79^{c}	8.89^{ab}	192.66^{c}	15.60^{b}	89.58^{ab}	7.25^{c}
16	M	338.18	25.40	106.45	7.99	211.80	15.90	89.93	6.74
	F	296.83	26.96	102.36	8.60	179.95	16.33	77.20	7.04
	Mean	324.40^{c}	26.18^{c}	102.36^{b}	8.30^{c}	195.88^{c}	16.11^{b}	83.57^{a}	6.89^{c}
	SEM	6.20	0.51	1.35	0.32	4.57	0.41	1.86	0.23
Sex (S)		19.65**	16.65**	0.01	2.37	6.79**	0.03	0.03	2.38
Age (A)		10.28**	210.70**	12.13**	18.40**	5.28**	28.92**	28.92**	16.88**
S X A		1.45	6.87**	0.50	3.61*	2.56	2.55	2.55	0.29

F=Female, M=Male, * P<.05, ** P<.01
Means for ages with no common superscripts differ significantly
MES Pooled standard error means

as main effect. When it was significant F values were obtained. Treatment and means were compared by Duncan's Multiple Range Tests (Gomez and Games, 1984). The data were then analyzed by regression of the trait equation on live BW within sex and sex combined.

RESULT AND DISCUSSIONS

Body weight and carcass yields, and expressed as a percentage of live BW are shown in Table 1. Live BW increased significantly until 10 weeks of age (P<.01), even-though the increase of live BW was not significantly different. Live BW at 16 weeks of age at present study was 1331,13 g for male and 1099,75 g for female. It was heavier compare to study result was found by Mulyadi and Wihandoyo (895,3 g for male and 793,4 g for female) but lighter to by Sudibyo, 1984 (1496,11 g for male and 1393,10 g for female). It was shown that variability among local duck were still high.. Carcass yield of live BW were increased as the increasing age and live BW (P<.01). Male carcass yield was greater than female, but when it was expressed as a percentage of live BW, percentage of carcass female was greater than male (P<.01). That was different with the result on Broiler (Brake *et al.*, 1993) and on Quail (Yalcin *et al.*, 1994) that male's carcass yield or expressed as a percentage live BW was greater than female

Components of carcass weight and when expressed as a percentage of live BW were shown in Table 2. All components of carcass except drumsticks shown that weight of carcass components was increase significantly with the increasing age. Breast, wings, and thigh weight increased significantly (P<.01) until the duck reached 12 weeks of age for breast, 10 weeks of age for wings and thigh, eventhough the increasing

Table 3. Regression Equations for Weights of Carcass Components as a Function of Average Body Weight Age 8 to 12 weeks of Local Duck

Component	Equation	R^2
Breast		
Male	$Y = -161.5 + 0.428\ BW + 0.000104\ BW^2$	0.79
Female	$Y = -183.1 + 0.5099\ BW - 0.000081\ BW^2$	0.85
Male + Female	$Y = -221.8 + 0.5592\ BW - 0.000104\ BW^2$	0.82
Wings		
Male	$Y = -23.29 + 0.14388\ BW - 0.00029\ BW^2$	0.79
Female	$Y = -69.22 + 0.22709\ BW - 0.000066\ BW^2$	0.78
Male + Female	$Y = -1.21 + 0.1069\ BW - 0.000013\ BW^2$	0.79
Thigh		
Male	$Y = 294 - 0.1578\ BW + 0.00089\ BW^2$	0.32
Female	$Y = -120.2 + 0.3632\ BW + 0.00009\ BW^2$	0.63
Male + Female	$Y = 55.32 + 0.117\ BW - 0.000008\ BW^2$	0.47
Drumsticks		
Male	$Y = 113.47 - 0.08729\ BW + 0.000059\ BW^2$	0.43
Female	$Y = 107.1 - 0.10728\ BW + 0.000081\ BW^2$	0.54
Male + Female	$Y = 75.43 + 0.03436\ BW + 0.000041\ BW^2$	0.51
Total Carcass		
Male	$Y = 110 + 0.31\ BW + 0.00013\ BW^2$	0.89
Female	$Y = -274.1 + 0.0108\ BW - 0.000165\ BW^2$	0.91
Male + Female	$Y = -18.3 + 0.5454\ BW - 0.000033\ BW^2$	0.90

Y is the performance of the carcass component yield when the BW is inserted in gram on the mathematical model.

weight was not significantly different with the increasing age. Weight ofdrumsticks seemed decreasing with the increasing age ($P<.01$) although there was an increasing weight from 8 to 10 weeks of age, it maybe duck was belonging to waterfowl so they did not need strong drumsticks.

Carcass components expressed as a percentage of lives BW were increase significantly ($P<.01$) except thigh and drumsticks. Breast and wings percentage increased significantly but thigh and drumsticks decreased significantly with the increasing age ($P<.01$). Male components of carcass weight was greater than female, but when it was expressed as a percentage of live BW, female carcass components greater than male ($P<.01$). Carcass Yield or carcass components did not exhibit an interaction except for the wings ($P<.05$) and breast percentage ($P<.01$).

Total carcass yield and carcass components changed as the BW of the duck increase (Table 3). For females, the weight of total carcass, breast, and wings decreased as the BW of the duck increased as well as for the sex combination, while for males, total carcass, drumsticks and thigh increased as the BW decreased.

CONCLUSION

The yield of carcass components of local duck depended on slaughtered age and the components itself. Carcass and carcass components yield of male were greater than female but when it was expressed as a percentage of live BW female was greater than male. The yield of carcass components changed as the BW of the duck increase.

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