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COMPARISON OF MORPHOMETRIC SWAMP BUFFALO AT AGE LEVELS AND TYPE OF SEX DIFFERENCES IN TENAYAN RAYA DISTRICT PEKANBARU CITY

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ABSTRACT

Buffalo is one of meat producer ruminant that is usually found in Riau Province. Growth and development of animal body can be known through the body measurements (morphometrics) such as body length, chest circumference, shoulder height, pelvic height, scrotums circumference and body weight, can be used as basis in selecting the replacement stock. The study aimed to know and compare of morphometric males of swamp buffaloes and females in age levels and type of sex differences in Tenayan Raya District Pekanbaru City. One hundred and twenty heads of swamp buffaloes in Tenayan Raya district used to evaluate in this study. They were divided into three age group; 6-12 months, 13-18 months and 36-60 months. Each group was allowed by male and female. The results showed that the morphometric of swamp buffaloes in Tenayan Raya District were better than the results of research in several places and replacement stock standards of swamp buffalo's at Riau Province and known through their morphometric uniform with coefficient of variation less than 20%. The results from analysis of variance also showed no difference (P>0.05) males swamp buffalo morphometric and females in different ages level except male swamp buffaloes age 13 - 18 months, their body weight is smaller than the females.

Keywords: morphometric, age, type, sex, swamp buffalo

INTRODUCTION

Self sufficiency of meat into a government program can not be realized due to the development of livestock population in Indonesia is still running slow. This is due to the low productivity of local livestock and germplasm developed over the years. Local livestock development is expected to reduce the need for and dependence on imports of meat or cattle which reach 35% of the total requirement.

Buffalo is one of ruminant meat producer that is usually found in Riau Province. Provincial Livestock Office Statistics show that the buffalo population in the Province of Riau in 2005 counted 47, 799 and increase to 50,161 in 2006 with a growth rate of 4,94% (Hidayati 2009). Nationally, the population growth rate of buffalo and buffalo meat production is still slow (Table 1), far below the target of national beef production that is equal to 7.92% per annum (Warly, L., 2010)

The swamp buffaloes, plays an important role in the brick making industry that is in the *perancahan process*. Perancahan is the process of mixing clay and water in a hole so that smooth dough is formed and ready for printing (Hidayati, 2009). Although swamp buffaloes are economically very important to smallholder farmers, their populations, size and weight have steadily decline in some areas due to high extraction rate, progressive agricultural mechanization, improper breeding, feeding and disease control measures and no infrastructure for development of swamp buffaloes.

Swamp buffaloes in Tenayan Raya district, are managed by farmers with minimum inputs of time and money. They are allowed to graze on natural pasture lose to water during the day and are corralled at the night. No concentrate or mineral supplements are fed. This condition allowed the growth and development of buffaloes is not optimal and would also tend to lead to incest *(inbreeding)*. The incest would be decreased genetic quality of buffalo so that its productivity is low. Growth and development of animal body can be known through the body measurements

(morphometrics) such as body length, shoulder height, heart girth, pelvic height and scrotums circumference, can be used as basis in selecting the replacement stock.

MATERIALS AND METHODS

The method used in this study was survey and the data was collected as simple random sampling. One hundred and twenty heads swamp buffaloes in Tenayan Raya district used to evaluate in this study. They were divided into three age level; 6-12 months, 13-18 months and 36-60 months. Each level was allowed males and females. The parameters in this study were body length, body height, chest circumference, pelvic height and scrotums circumference. The data was analyzed used to analysis of variance to know influenced sexes for mophometric swamp buffaloes.

RESULTS AND DISCUSSIONS

The study was showed that the morphometric swamp buffalo in Tenayan Raya District better than the standard breed of Riau Province Number: 524.21/PTBTK/473.a/06.02 year 2003 (Table 1) and the results of other studies in other areas.

The results of analyzed showed variability coefficient value of swamp buffaloes less 20%, which indicates that the swamp buffaloes morphometrics were uniforms (Table 3). The results of Analysis of Variance (ANOVA) also showed males swamp buffaloes morphometrics and female on different age levels are no difference (P>0.05).

This study showed that body length of male and female buffaloes on different age levels (Table 2) are better than result study of Zulbardi and Kusumaningrum (2005) in Brebes Central Java. The body length of 6-12 months was higher than female, while at age 13-18 months and 36-60 months showed the same body length between males and females. At Age 6-12 months is the age for body growth and development of livestock. If buffaloes are experiencing stress and sustainable fed shortage will not affect the optimal growth and development of the body. According to Diwyanto *et al.* (1984) in Marsucipto (2008), the greater and the longer the animal's body will cause body weight increase. Body size has a relationship with body weight are the heart girth and body length.

The results of the study showed that male and female swamp buffaloes at 36 - 60 months had height is greater than Parker (1984) in Murti and Ciptadi (1987), that the adult buffalo heights ranging from 135 cm for male and 130 cm for female and greater than the standard replacement stock of swamp buffaloes of Riau Province, that Buffalo will be used as replacement stock should which has a minimum height of 110 cm for males and for females at least 105 cm. Based on the analysis of variance, that at 6 -12 months, 13-18 months and 36-60 months was not significantly different (P> 0.05) between male and female. At the age of 6-12 months, height of females are smaller than the males and at 13-18 months, height of female is greater than the male and at 36-60 months showed the same height between male and female.. According to Soeparno (1994) explains that livestock growth regulated by hormones, either directly or indirectly. There are differences among the breed of cattle against the influence of hormones, such as the effect of growth hormone, *insulin* and *thyroxine*. Sex *steroids* also have an important role in regulating growth, especially on body composition differences between the sexes.

Heart girth of males and females swamp Buffalo at all aged levels is better than Chantalakhana's opinions (1981) in Murti and Ciptadi (1987) explain that the range of heart girth adults are 180-209 cm and Zulbardi and Kusumaningrum (2005) founded that the heart girth buffalo males and females at 7 - 12 months in Brebes; 119.50 cm and 127.00 cm, at 13-18 months; 153.50 cm and 137.80 cm, while at 24 months; 162.11 cm and 178.96 cm. Comparison heart girth males and females showed that was not significantly different (p> 0.05). Girth heart of males swamp buffaloes was bigger than the female at 6 - 12 months. In other hands, girth heart male and female at aged 13-18 months and 36-60 months showed the same. According to Soeparno (1994) explains that the androgen a hormone that is included as growth regulators or stimulants. Androgen produced by *interstitials* cells and *Adrenal kelenjar.* One of the high *androgen steroids* cause high *Androgen Secretion* resulted in growth in male cattle more rapidly than female cattle, especially after the appearance of secondary sex characteristics. At the age of more than one year, livestock already started worked so the effect of hormone did not appear again.

Table 2. Comparison of Morphometriscs of Swamp Buffaloes at Different Ages and Sex in Tenayan Raya District Pekanbaru City.

Parameters	Age (Months)	Swamp-Buffaloes Morphometric		Standard Seed Livestock and Results of other studies	
		Male	Female	Male	Female
Body length	06 - 12	96.65	90.45	85,75 (P_2)	87,33 (P_2)
	13 -18	116.58	116.20	101,00 (P_2)	88,80 (P_2)
	36 - 60	134,45	134.1	106,00 (P_2)	117,13 (P_2)
Shoulder Height	13-18			97.75 (P_2)	101.11 (P_2)
		104.95	99.25	110.50 (P_2) /	105.60 (P_2) /
		111.70	114.20	110 (SB)	105 (SB)
		123.33	122.38	135 ($P_{1)}$	130 (P_1)
Heart Girth	36 - 60	138	125.75	119.50 (P_2)	127.00 (P_2)
		163.10	159.50	153.50 (P_2)	137.80 (P_2)
		183.4	186.8	162.11 (P_2)	178.96 (P_2)
Pelvic Height	6 -12	105.55	99.60	- -	- -
	13-18	112.80	114.50	- -	- -
	36 - 60	122.95	121.65	- -	- -
Scrotum Circumference	6 - 12	14.0	- -	- -	- -
	13-18	17.88	- -	- -	- -
	36 - 60	21.35	- -	- -	- -

Notes :

($P_{1)}$ = Parker in Murti and Ciptadi (1978)

($P_{2)}$ = Zulbardi and Kusumaningrum (1987)

($P_{3)}$ = Chantalakhana (1884) in Murti and Ciptadi (1987)

(SB) = Anonimous(2003).

Table 3. Comparison of morphometric males swamp buffaloes and females at different ages and sex in Tenayan Raya District Pekanbaru City

No	Parameters (cm)	Age (months)	Males (cm)			Females (cm)			ANOVA
			Mean	SD	CV	Mean	SD	CV	
1	Body Length	6-12	96.65	14.71	15.22	90.45	14.24	15.72	P>0,05
		13-18	116.58	10.46	8.98	116.20	7.73	6.65	P>0,05
		36 - 60	134,45	8.41	6.25	134.1	6.28	4.46	P>0,05
2	Shoulder Height	6-12	104.95	10.43	9.94	99.25	10.55	10.63	P>0,05
		13-18	111.70	6.65	5.78	114.20	6.00	5.25	P>0,05
		36 - 60	123.33	5.53	4.48	122.38	4.73	3.873	P>0,05
3	Heart Girth	6-12	138	18.89	13.59	125.75	18.85	14.64	P>0,05
		13-18	163.10	11.88	7.29	159.50	9.22	5.80	P>0,05
		36 - 60	183.4	8.22	4.48	186.8	7.99	4.28	P>0,05
4	Pelvic Height	6-12	105.55	11.33	10.75	99.60	11.98	12.03	P>0,05
		13-18	112.80	6.21	5.51	114.50	5.38	4.69	P>0,05
		36 - 60	122.95	5.05	4.11	121.65	3.94	3.24	P>0,05
5	Scrotum Circumference	6-12	14.05	2.33	16.61	- -	- -	- -	- -
		13-18	17.88	1.88	10.54	- -	- -	- -	- -
		36 - 60	21.35	4.04	18.92	- -	- -	- -	- -

Swamps buffaloes males and females had uniform pelvic heights (CV <20%). Based on the results of analysis of variance at 6-12 months, 13-18 months and 36-60 months was not significantly different (p> 0.05). The scrotum circumferences, one of the characteristics for selection of superior males. The larger circumference of scrotum will be produced the

number of sperm and high level of the fertility. This study showed scrotum circumferences are 14.05 cm (6-12 months); 17.88 cm (13-18 months) and 21.35 cm (36-60 months).

CONCLUSION

The results showed that the morphometrics of swamp buffaloes in Tenayan Raya District were better than the results of research in several places and replacement stock standards of swamp buffalo's Riau Province and known through their morphometric uniform with coefficient of variation less 20%. The results of analysis of variance also showed no difference (P>0.05) males swamp buffalo morphometric and females in different ages level.

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Questions:
The buffalo condition in Riau is quite similar with in Java. So, what the meaning of morphometric on male and female that was found similar?

Anwers:
In Riau, buffalo was raised extensively, breeding in the open area, but the farmer know and remember every buffalo of they own. The similar body measurement in male and female might be due to the poor feeding allowed to the buffalo.