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STUDIES ON POST WEANING BODY WEIGHT AND BODY MEASUREMENTS OF OSMANABADI GOATS

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ABSTRACT

The data pertaining to the 1934 Osmanabadi kids maintained at Post Graduate Institute Goat Unit, MPKV, Rahuri were utilized for the present study. Period and season of birth and sex of kid were considered as sources of variation in post weaning body weights and measurements of Osmanabadi kids. The collected data were analyzed by least squares method. The least squares means recorded for body weight at six months, nine month and twelve months age were 10.57 ± 0.09 , 12.93 ± 0.10 and 15.82 ± 0.23 kg, respectively. The least squares means for body length, height at withers and chest girth at six months and nine months age were 51.10 ± 0.33 , 52.50 ± 0.36 , 51.17 ± 0.36 and 58.39 ± 3.05 , 59.60 ± 3.31 , 57.43 ± 0.50 cm, respectively. Period of birth had significant ($P < 0.01$) effect on body weight at six months and weight at nine months age. Season of birth significantly influenced all traits under study at six months age and significant effect on heart girth at nine months age. Sex had significant effect on all traits at six month age, body weight and hearth girth nine months age.

Key Words: *Post weaning weight, Osmanabadi goat, non genetic factors*

INTRODUCTION

Goat is important economic species of livestock in developing countries. It provides major source of income to pastoral communities and poor villagers in India. Osmanabadi is an important medium sized breed found predominantly in arid and semi arid region of Maharashtra. Osmanabadi goat is hardy, capable of walking long distance and has strong disease resistance. Therefore present investigation, an attempt has been made to evaluate its genetic potential for growth in order to adopt effective selection criteria and suitable breeding plan.

MATERIALS AND METHODS

The data related to 1934 growth records of Osmanabadi goats maintained at P.G. Goat unit, Mahatma Phule Krishi Vidyapeeth, Rahuri for the period of 1993 to 2007 (15 years) were collected and used for present investigation. The data were classified according to period of birth viz., P_1 (1993-1996), P_2 (1997-2000), P_3 (2000-2004) and P_4 (2000 and above). Each year was further sub divided into three seasons viz. rainy (June-Sept), winter (Oct-Jan) and summer (Feb-May). The sex of kid viz., male and female was also considered as source of variation. The least squares analysis was carried out to study the effect of these non-genetic factors (Harvey, 1990) on post weaning body weights and measurements of Osmanabadi goats.

RESULTS AND DISCUSSION

The overall body weight and body measurements viz., body length, height at withers and heart girth recorded in Osmanabadi goats at 6 months of age were 10.57 ± 0.09 kg and 51.10 ± 0.33 , 52.58 ± 0.36 and 51.17 ± 0.36 cm, respectively. Similar values were reported by Das *et. al.* (1995) whereas, comparatively higher body weight at 6 months age was reported by Rai *et. al.* (2003) in Jakhra (16.47 \pm 0.49 kg) goat.

The overall body weight and body measurements viz., body length, height at withers and heart girth at 9 months of age noticed in Osmanabadi goats were 12.93 ± 0.10 kg and 58.39 ± 3.05 , 59.60 ± 3.31 and 57.43 ± 0.50 cm, respectively.

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Table 1. Least square means for post weaning body weights of Osmanabadi goats

Sources of variation	Body weight (kg) at					
	n	Six month	n	Nine month	n	Twelve month
Overall	1426	10.57±0.09	1062	12.93±0.10	550	15.82±0.23
Period of birth						
P ₁	252	11.88 ±0.19 ^a	193	14.80 ±0.21 ^a	137	18.58 ±0.34 ^a
P ₂	506	11.16±0.13 ^b	329	13.36±0.16 ^b	144	16.73±0.32 ^b
P ₃	524	10.01±0.13 ^c	447	12.23±0.14 ^c	237	14.74±0.26 ^c
P ₄	144	9.24±0.25 ^d	93	11.32±0.30 ^d	32	13.22±0.66 ^d
Season of birth						
S ₁	399	10.89±0.15 ^a	252	14.04±0.18 ^a	130	17.62±0.35 ^a
S ₂	633	10.52±0.13 ^b	497	12.46±0.15 ^b	310	14.39±0.27 ^c
S ₃	394	10.32±0.15 ^b	313	12.29±0.17 ^b	110	15.45±0.38 ^b
Sex						
Male	733	11.13±0.12 ^a	505	13.60±0.14 ^a	155	16.59±0.34 ^a
Female	693	10.02±0.12 ^b	557	12.26±0.13 ^b	395	15.05±0.22 ^b

Table 2. Least squirm mean for post weaning body measurements of Osmanabadi goats

Effects	At 6 months of age				At 9 months of age			
	n	Body measurements (cm)			n	Body measurements (cm)		
		Body length	Height at withers	Heart girth		Body length	Height at withers	Heart girth
μ	355	51.10±0.33	52.58±0.36	51.17±0.36	255	58.39±3.05	59.60±3.31	57.43±0.50
Period of birth								
P ₁	252	51.37±0.34	52.82±0.37	51.10±0.37	192	59.44±3.12	60.82±3.39	57.08±0.52
P ₂	103	50.82±0.42	52.34±0.46	51.22±0.46	63	57.34±3.94	58.38±4.28	57.78±0.65
Season of birth								
S ₁	42	49.31±0.74 ^c	50.73±0.81 ^c	50.01±0.80 ^b	28	56.65±6.84	57.55±7.41	56.81±1.13 ^b
S ₂	194	52.71±0.35 ^a	54.27±0.39 ^a	52.71±0.38 ^a	124	62.98±3.62	64.87±3.53	59.84±0.60 ^a
S ₃	119	51.27±0.46 ^b	52.75±0.50 ^b	50.77±0.50 ^b	103	55.55±3.78	56.38±4.10	55.63±0.62 ^b
Sex								
Male	173	51.77±0.42 ^a	53.28±0.46 ^a	51.86±0.45 ^a	99	58.24±4.16	59.56±4.51	58.35±0.69 ^a
Female	182	50.42±0.41 ^b	51.89±0.45 ^b	50.47±0.44 ^b	156	58.55±3.53	59.64±3.83	56.51±0.58 ^b

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Table 3. Analysis of variance for post weaning body weights and measurements in Osmanabadi goats

Sources of variation		Body weight (kg)		d.f.	Body measurements (cm)		
					Length	Height at withers	Heart girth
		d.f.	M.S.S.		M.S.S.	M.S.S.	M.S.S.
At six months age							
1	Period of birth	3	324.40**	1	21.23	16.67	0.99
2	Season of birth	2	63.56*	2	224.57**	244.29 **	204.17 **
3	Sex	1	432.29 **	1	159.87 *	167.71 *	167.45 *
4	Error	1419	12210.03	350	22.42	26.81	26.40
At nine months age							
1	Period of birth	3	383.28**	1	205.86	281.57	22.93
2	Season of birth	2	248.10**	2	1572.01	2059.22	483.36**
3	Sex	1	470.36**	1	5.57	0.37	192.04*
4	Error	1055	8.46	250	1273.49	--	--
At twelve months age							
1	Period of birth	3	522.44**	--	--	--	--
2	Season of birth	2	446.50**	--	--	--	--
3	Sex	1	258.07**	--	--	--	--
4	Error	543	13.17	--	--	--	--

* = $P < 0.05$, ** = < 0.01

Table 4: Least Squares means for body weights and measurements at six months age in Osmanabadi goats

Sources of variation	At six months age			
	Weight (kg)	Length (cm)	Height at Withers (cm)	Heart girth (cm)
Overall	10.57±0.09 (1426)	51.10±0.33 (355)	52.58±0.36 (355)	51.17±0.36 (355)
Period of birth				
P ₁	11.88 ±0.19 (252)	51.37±0.34 (252)	52.82±0.37 (252)	51.10±0.37 (253)
P ₂	11.16±0.13 (506)	50.82±0.42 (103)	52.34±0.46 (103)	51.22±0.46 (102)
P ₃	10.01±0.13 (524)	-----	-----	-----
P ₄	9.24±0.25 (144)	----	----	----
Season of birth				
S ₁	10.89±0.15 (399)	49.31±0.74 (42)	50.73±0.81 (42)	50.01±0.80 (43)
S ₂	10.52±0.13 (633)	52.71±0.35 (194)	54.27±0.39 (194)	52.71±0.38 (194)
S ₃	10.32±0.15	51.27±0.46	52.75±0.50	50.77±0.50

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	(394)	(119)	(119)	(118)
Sex				
Male	11.13±0.12 (733)	51.77±0.42 (173)	53.28±0.46 (173)	51.86±0.45 (173)
Female	10.02±0.12 (693)	50.42±0.41 (182)	51.89±0.45 (182)	50.47±0.44 (182)

The average body weight recorded at 12 months age in Osmanabadi Goats was 15.82±0.23 kg. Similar body weight at 12 months age were reported by Swami *et. al.* (2006) in Barbari x Shirohi (24.65±0.66) goats.

Period of birth, season of birth and sex had significant ($P<0.01$) effect on body weight at 6, 9 and 12 months age except sex at 6 months weight Non-significant effect on all body measurements at 6 and 9 months of age was observed in Osmanabadi goats. The result were in agreement with the Kumar *et.al.*(1992) in Jamunapari goats.

Table 5. Least Squares means for body weights and measurements at nine months age Osmanabadi goats

Sources of variation	At nine months age			
	Weight (kg)	Length (cm)	Height at Withers (cm)	Heart girth (cm)
Overall	12.93±0.10 (1062)	58.39±3.05 (255)	59.60±3.31 (255)	57.43±0.50 (444)
Period of birth				
P ₁	14.80 ±0.21 (193)	59.44±3.12 (192)	60.82±3.39 (192)	57.08±0.52 (192)
P ₂	13.36±0.16 (329)	57.34±3.94 (63)	58.38±4.28 (63)	57.78±0.65 (63)
P ₃	12.23±0.14 (447)	----	----	----
P ₄	11.32±0.30 (93)	----	----	----
Season of birth				
S ₁	14.04±0.18 (252)	56.65±6.84 (28)	57.55±7.41 (28)	56.81±1.13 (28)
S ₂	12.46±0.15 (497)	62.98±3.62 (124)	64.87±3.53 (124)	59.84±0.60 (124)
S ₃	12.29±0.17 (313)	55.55±3.78 (103)	56.38±4.10 (103)	55.63±0.62 (103)
Sex				
Male	13.60±0.14 (505)	58.24±4.16 (99)	59.56±4.51 (99)	58.35±0.69 (99)
Female	12.26±0.13 (557)	58.55±3.53 (156)	59.64±3.83 (156)	56.51±0.58 (156)

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Table 6. Least Squares means for body weight at twelve months age in Osmanabadi goats

Sources of of variation	At twelve months age
	Weight (kg)
Overall	15.82±0.23 (550)
P ₁	18.58 ±0.34 (137)
P ₂	16.73±0.32 (144)
P ₃	14.74±0.26 (237)
P ₄	13.22±0.66 (32)
S ₁	17.62±0.35 (130)
S ₂	14.39±0.27 (310)
S ₃	15.45±0.38 (110)
Male	16.59±0.34 (155)
Female	15.05±0.22 (395)

The DMRT indicate that body weight at 6 , 9 and 12 months of age of kids were significantly decreased as period advanced .This might be due to the changes occurred in management in different periods. The kids born in the kid season S₁(10.88±0.314) and makes had significantly highest S₁ weight than females (11.12±0.118 vs 10.024±0.120 kg) born in different seasons.

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