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Factors Affecting Birth Weight in Sirohi Goat Kids

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A B S T R A C T

A study was conducted on birth weight Forty Sirohi goat kids (20 male and 20 female) were used to investigate the effect of sex, type of birth and season of birth weight. Season of kidding was classified as autumn and winter. The overall birth weight of kids was 2.57± 0.036 kg. The male kids showed significantly higher birth weight than female ie., 2.67±0.051 and 2.46±0.041kg, respectively. This may be due to the effect of male sex hormone, which influences grow faster during pre-natal development. The kids born as single (2.66±0.051kg) were significantly heavier than those born as twins (2.30±0.052 kg) which is obvious because in multiple births the nutrients available from the mother are shared by twin kids. Kids born during winter (2.60±0.052 kg) were heavier than kids born in the autumn season (2.53±0.051 kg). This might be due to better availability of good quality green fodder during breeding season and pregnancy period.

Introduction

The goat "Movable Wealth" for nomads, small and marginal farmers and land less labours has tremendous potential to be projected as the 'Animal of Future' for rural prosperity. The agro-geo-climatic conditions are changing and resources depleting continuously for crop-based livelihood. In India, we have 23 well defined goat breeds. India possesses the second-largest goat population in the world having 135.17 million goats, but their population has declined by 3.82% over the previous census (Anonymous, 2012). Goat farming plays an important role in the up liftment of rural economy and livelihood which is creates employment of rural youth. This is because goats can thrive in hardy weather conditions and can be conveniently reared on uncultivable land where dairy farming is not economical. Sirohi is a dual purpose breed of goat native of central and southern regions of Rajasthan. These goats breed have a high resistance to disease and adapt well to hot, dry deserts areas. Birth weight is an economic indicator for any livestock production purpose. There is a positive correlation in birth weight and further increasing of the live weight of animals (Roy *et al.*, 1989). Studies of various authors show that birth weight is influenced by sex, type of birth, season of birth, maternal age and more (Supakorn and Pralomkarn, 2009; Bharathidhasan *et al.*, 2009). The

present study pertains to the effect of season of birth, sex of kid and type of birth in Sirohi goat kids as reported under intensive system. A flock of Sirohi goat kids (20 male and 20 female) goats were being maintained at, SKN College of Agriculture Jobner (Jaipur). Season of kidding was classified as autumn and winter. Hence, an attempt has been made to appreciate the pattern of seasonal births and their effect on birth weight in Sirohi goats under intensive system of management reared in an organized farm.

Materials and Methods

The birth record of 40 Sirohi goat kids (20 males and 20 females). Out of 40 goat kids, 30 kids were single born and remaining 10 kids were twins. The experiment was conducted at RKVY Project Sirohi goat farm, S.K.N. College of Agriculture, Jobner, District Jaipur, (Rajasthan, India). Geographically, Jobner is located 45.0 km west of Jaipur at 260 05' North latitude, 750 28' East longitude and at an altitude of 427 meter above sea level. There were two kidding seasons during the period of study i.e. autumn (October) and winter (December) in year 2015. The births recorded were also classified according to their sexes. Birth weights of 40 kids were classified according to sexes, type of birth (single/twins) and season. Fresh water was provided for 24 hrs in the shed. The feeding practice remained uniform throughout the study period. The kids were provided with proper housing and were cared by staff and veterinary care provided as and when necessary. All kids were reared under *intensive* system of standard management practices. The animals were provided with anti-helminthetic preparations as per approved schedule and guidelines. During the experimental period all the weather protections were uniform. Data were analyzed according to the procedures suggested by Snedecor and Cochran (1994) and the difference between treatment means was tested for significance by Duncan's multiple range and F Test (Duncan, 1955).

Results and Discussion

Effect of sex of kid on birth weight

The data were tabulated according to the sex of kids to determine the effect of sex on birth weight. It was observed that out of total births of 40, males were 20 and females 20 in ratio of 50 and 50 percent respectively. Table 1 shows that overall mean birth weight was 2.57±0.036 kg. The result pertaining to the average body weight at birth for male kids and female kids were 2.67±0.051 and 2.46±0.415 kg respectively. It was also found that male kids weighed 8.54 % higher birth weight than female kids in Sirohi goat kids. The statistical analysis of data revealed that sex had significant ($P<0.01$) effect on birth weight of Sirohi goat kids. Banerjee and Jana (2010) also reported significant effect of sex on birth weights in Sirohi goat kids. Present findings corroborated to reports of Chawla *et al.,* (1984), Sanchez *et al.,* (1994), Tomar *et al.,* (1997), Raza *et al.,* (1998), Elabid (2008), Bharthidhasan *et al.,* (2009), Bhusan (2012), Singh *et al.,* (2013) and Harikrishna *et al.,* (2013). This may be due to anabolic effect of male hormones (Hafez, 1962 and Chandra *et al.,* 2009) which influences growth factor during pre-natal development. However, Baiden (2007) reported similar birth weights ($P>0.05$) between single births (1.43±0.04 kg) and twins (1.34±0.03 kg) but singles were significantly heavier ($P<0.05$) than triplets (1.24±0.05 kg). This might be attributed to effect of location, breed and seasons in Ghana.

Effect of season of birth weight

The birth weight of a total 40 kids, 20 in autumn (October) and 20 in winter (December) was recorded during the

experiment period. Table 1 revealed that the average birth weight of Sirohi goat kids was 2.53±0.051 kg and 2.60±0.052 kg during autumn and winter season respectively. It is clear from the table that the average birth weight of kids was higher during winter season than autumn season. This might be attributed to abundant availability of good quality green fodder during gestation period of does. In the present study, season had no significant effect on birth weight of Sirohi goat kids. Present findings were conformed to the work of Raza *et al.,* (1998), Baiden (2007), Thiruvenkadan *et al.,* (2008), Bharthidhasan *et al.,* (2009), Chandra *et al.,* (2009), and Bhusan (2012). However, Salah *et al.,* (1989), Paul *et al.,* (1990), Elabid (2008), Benerjee and Jana (2010), Meel *et al.,* (2010) also reported significant effect of season on birth weight of goat kids. This might be attributed to effect of large number of observations, period, breed and environmental factors.

Effect of birth type on birth weight

Table 1 revealed that the mean birth weight of single birth of 30 kids and twin birth of 10 kids was 2.66±0.031 kg and 2.30±0.052 kg, respectively. The statistical analysis of data showed that type of birth had significant (P<0.01) effect on birth weight of Sirohi goat kids. Banerjee and Jana (2010) also reported significant effect of type of birth on birth weights in Sirohi goat kids. The kids born as singles were heavier than those born as twins. Present findings is agreement to the reports of Tomar *et al.,* (1997), Neeru and Kumar (2002), Thiruvenkadan *et al.,* (2009), Elabid (2008), Bharthidhasan *et al.,* (2009), Chandra *et al.,* (2009), Bhusan (2012), Hristova *et al.,* (2013) and Hegan *et al.,* (2014). Higher birth weight of single born kids was due to more nutrition available from the mother during prenatal period. Another factor might be the limitation of space in the uterus for the growth of multiple kids during prenatal period. However, Baiden (2007) reported similar birth weights (*P*>0.05) between single births (1.43±0.04 kg) and twins (1.34±0.03 kg) but singles were significantly heavier (*P*<0.05) than triplets (1.24±0.05 kg) goat kids. This might be attributed to effect of location, periods, breed and seasons in Ghana.

Table.1 Birth weight in Sirohi goat kids for various parameters

parameters	N	Birth weight (Kg) Mean±SE	Signficance
Overall	40	2.57 ± 0.036	
Sex			**
Male	20	2.67±0.051	
Female	20	2.46±0.041	
Season			NS
Autumn	20	2.53±0.051	
Winter	20	2.60±0.052	
Type of birth			
Single	30	2.66±0.031	**
Twins	10	2.30±0.052	

In Sirohi goat, male kids were weighed 8.53% higher birth weight than that of female kids during the year of the experiment. Average birth weights of the kids were 2.53±0.051 and 2.60±0.052 Kg during autumn (October) and winter (December) season respectively. Birth weight in winter season was found higher than the autumn season but no significant effect of season was observed. It was found that on average birth weight of single born kids (2.66±0.051 kg) had significantly ($P<0.01$) higher birth weight than twins (2.30±0.052 kg) which was obvious because in multiple births the nutrients available from the mother are shared by twin kids. Another factor might be the limitation of space in the uterus for the growth of multiple kids during prenatal life.

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