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EFFECT OF BIRTH WEIGHT ON MORTALITY AND OCCURRENCE OF DISEASES IN CROSSBRED KIDS

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ABSTRACT

Records of 2001 AB (Alpine X Beetal) and SB (Saanen x Beetal) crossbred kids upto six months of age were analyzed to study the effect of birth weight on mortality and morbidity. Irrespective of sex average birth weight was 3.06 kg. Male kids had slightly higher (3.140 ± 0.017 kg) than female (2.964 ± 0.016 kg). The mortality rate for group 1 (<2.6 kg), group 2 (2.6 to 3.1 kg), group 3 (3.2 to 3.7 kg) and group 4 (> 3.7 kg) were 18.20, 14.57, 14.24 and 17.71 %, respectively. In SB male kids, mortality rate was found significantly (P<0.05) higher than other groups.

Morbidity rate was recorded to be 35.33% in kids up to the age of six months. Morbidity rate was high in group 1 (36.78%) and in group 4 (36.75%) than group 2 (33.86%) and group 3 (35.75%) but difference was found non-significant.

The probable reason for high kid mortality and morbidity among low birth weight groups were low energy reserves and lower thermo-regulatory capacity. Thus, the birth of lighter kids is a serious economic loss and calls for checking the nutrition of the mother in advanced stage of pregnancy. High mortality rate and morbidity rate in birth weight group higher than the average may be attributed to some unknown abnormality in the kid.

Keywords : Crossbred Kids, Moriality, Birth Weight, Morbidity

Birth weight is the first observed trait in a life of an animal on which growth, reproduction and production traits depend. Birth weight influences the mortality and morbidity in kids and affects the economic returns from goat farming [4]. Study of the relationship of birth weight on kids mortality and disease incidences will be of immense help in identifying the risk factors and also for devising suitable strategies to reduce mortality and disease incidence in a herd. The study was carried out to ascertain the effect of birth weight on mortality and morbidity in crossbred kids under stall-fed condition.

MATERIALS AND METHODS

The records of AB (Alpine x Beetal) and SB (Saanen x Beetal) crossbred kids, maintained in Cattle Yard at National Dairy Research Institute (NDRI), Karnal, were collected for a period of ten

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years (1995-2004). The tract is under semi-arid condition with annual rainfall of about 760 to 960 mm. Both the crossbred goats (AB and SB) are considered as seasonally polyestrous with extended breeding season. There are two breeding seasons and two kidding seasons. The main breeding season starts immediately after the onset of the monsoon, i.e., during June-July and kidding occurs during November-December. This comprises about 75 to 80 percent of total kidding, while the goats that bred in November-December, their kidding occurs in March-April, which is about 15 to 20 percent of the total kidding. Breeding was practiced by natural mating.

The newly born kids were allowed to suckle their dams for the first five days after birth. They were then fed whole milk according to their body weight by means of nipples either from bottles or by dipping nipples in milk in enameled washbasins 3 times a day up to 4 weeks of age. Frequency of milk feeding was reduced gradually to twice a day. Kids were fed milk until the attainment of 12 kg body weight. From two weeks onwards, kids were also offered *ad-lib*. green fodder and creep mixture @ 100-200 gm/day/kid. Quantity of concentrate mixture was gradually increased to 350 gm/day/kid along with *ad-lib*. green fodder. The kids were housed and maintained in groups under loose housing system and vaccinated against FMD, Enterotoxaemia and PPR diseases. Deworming was carried out once in 15 days up to the age of 3 months and thereafter once in a month up to six months of age.

According to birth weight, kids were grouped into four i.e. Group-1 (< Mean – S.D.), Group-2 (in between mean and mean –S.D.), Group-3 (in between mean and mean + S.D.) and Group-4 (> Mean + S.D.). To study the birth weight following models were used:

$$Y_{ij} = \mu + X_i + e_{ij}$$

Where,

μ = Overall mean,

e_{ij} = Error,

X_i = Effect of i^{th} [birth weight] on mortality and disease incidences.

The influence of various factors on mortality was analyzed by Chi-square test of goodness of fit[5].

RESULTS AND DISCUSSION

Effect of Birth Weight on Mortality:

Out of total 2001 kids born during the span of ten years, 308 kids died with overall mortality rate of 15.39 percent. Average birth weight was found to be 3.06 kg with Standard deviation of 0.5 for all the kids. Average birth weight of AB kids was 3.08 ± 0.02 kg and for SB kids was 3.18 ± 0.03 kg. Male kids had slightly higher weight (3.14 ± 0.02 kg) than female (2.96 ± 0.02 kg). Mortality rate in different birth weight groups are presented in Table 1. The effect of different breed and sex on mortality was found non-significant. Mortality rate was high for group (1) and group (4) but statistically non-significant. In case of SB male, mortality rate was found significantly ($P<0.05$) higher for group 4 than other birth weight groups.

Kids lighter than breed average in birth weight had higher mortality rate and concluded that as birth weight of kid decreases the mortality rate increases [2]. Similar results had been reported [1, 3&6] in kids. It has been concluded that the probable reason for high kid mortality among low birth weight groups were low energy reserves and

lower thermo-regulatory capacity in the kids having low birth weight. Further, higher mortality in purebred Angora and Angora crossbred kids in higher birth weight group 2.51 to 3.0 kg (26.0%) than average birth weight group[7]. High mortality rate in birth weight group higher than the average (group 4) may be attributed to some unknown abnormality in the kid, which needs further investigation.

Effect of Birth Weight on Disease Occurrence:

The data of 2001 kids born during the span of ten years were analyzed and overall morbidity rate was worked out as 35.33 %. Of 707 kids, 546 were recorded sick once, 133 twice and 28 kids were recorded sick more than twice up to the age of 6 months. The morbidity rate was analyzed on the basis of first incidence of disease and presented in Table 2.

Morbidity rate was high in group 1 (36.78%) and group 4 (36.75%). The morbidity rate was low in group 2 (33.86%) and group 3 (35.75%), but difference was found non-significant. High morbidity rate in low birth weight kids (Group1) may be due to low energy reserves and lower thermoregulatory capacity in kids. Hence kids with low birth weight may have less immunity and are more susceptible for various diseases, which is supported by the reports of earlier workers[1, 3&6]. Further, comparable higher morbidity in higher birth weight crossbred kids (Group 4) than average birth weight group was probably because of some unknown abnormality in the kids, which is corroborated with previous findings of workers [7].

Table 1. Birth weight-wise mortality rate (%) in crossbred kids of AB (Alpine x Beetal) and SB (Saanen x Beetal) breeds.

Breed	Sex	Birth Weight Groups								Total	
		1 (< 2.6 kg)		2 (2.6 to 3.1 kg)		3(3.2 to 3.7 kg)		4 (>3.7 kg)			
		No. of Kids Born	Mortality %	No. of Kids Born	Mortality %	No. of Kids Born	Mortality %	No. of Kids Born	Mortality %	Total No. of Kids Born	Overall Mortality %
AB	Female	150	16.67 (25)	260	12.31(32)	192	18.75 (36)	22	4.54 (1)	624	15.06 (94)
	Male	128	20.31 (26)	244	17.21 (42)	264	12.88 (34)	72	18.06 (13)	708	16.24 (115)
	Total	178	18.34 (51)	504	14.68 (74)	456	15.30 (70)	94	14.89 (14)	1332	15.69 (209)
SB	Female	52	21.15 (11)	98	17.34 (17)	140	16.43 (23)	22	13.64 (3)	312	17.31 (54)
	Male	38	13.16 (5)	98	11.22 (11)	162	9.26 (15)	59	23.73* (14)	357	12.61 (45)
	Total	90	17.78 (16)	196	14.29 (28)	302	12.58 (38)	81	20.98 (17)	669	14.79 (99)
Overall		368	18.20 (67)	700	14.57 (102)	758	14.24 (108)	175	17.71 (31)	2001	15.39 (308)

* Significant at 0.05 percent level of significance.
Values in parenthesis indicate the number of kids died.

Table 2. Morbidity rate (%) in kids in different birth weight groups.

Birth Weight (kg)	Total No. of Kids	No. of Kids Sick	Morbidity (%)
Below 2.6 kg	368	135	36.78
2.6 to 3.1 kg	700	237	33.86
3.2 to 3.7 kg	758	271	35.75
More than 3.7 kg	175	64	36.75
Total	**2001**	**707**	**35.33**

CONCLUSION

The probable reason for high kid mortality and morbidity among low birth weight groups were low energy reserves and lower thermo-regulatory capacity. Thus, the birth of lighter kids is a serious economic loss and calls for checking the nutrition of the mother in advanced stage of pregnancy. High mortality rate and morbidity rate in birth weight group higher than the average may be attributed to some unknown abnormality in the kid, which needs further investigation.

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