Discussion

The Black Bengal Goat, a prolific breed mainly located in the Eastern parts, is lacking attention of improvement programmes in spite of having a high potential to prolific. In order to accelerate the growth at birth and 6 months, 9 months and 12 months of age, its reproductive profiles need to be explored at this geo-climatic conditions. Keeping this in view the present study has been planned and executed, the findings of which has been documented in the form of results.

5.1 Body Weight

Kids are the base of future generation. Rapid and efficient growth of kids is essential, since it reduces the age at maturity, enhanced the activity of reproductive performances and other production potential.

The body weight recorded at birth of Black Bengal kid under present study is in agreement with Bhattacharya (1989), Singh et al. (1991) and Singh (1999) at birth, and at 1 month of age with Kumar and Singh (1983) and at 6 months of age with Bhattacharya (1989), Singh and Singh (1998) and Mishra and Sinha (2001). The result of higher value in male than in female at birth and other stages of growth is in agreement with Husain et al. (1996), Mahapatra and Nayak (1997), Husain et al. (1997), Singh and Singh (1998), Singh (1999) and Singh and Singh (2000) for Black Bengal goat.

Interaction effect of sex and season has a highly significant effect on body weight in Black Bengal goat recorded under the present study corroborates to the findings of Sinha and Sahni (1983), Singh (1997), Singh et al. (2002) who have observed a highly significant effect of season on birth weight, post weaning body weight of Black Bengal goats respectively. Mahapatra and Nayak (1997) reported that the birth weight of male Black Bengal goat was greater during winter than summer but there is no seasonal difference body weight of female. Similar to the present study, Ghosh et al (2001) reported that the kids born during cold humid season (September – February) were having higher birth weight than those born during hot humid seasons (March – August). Similar to the present study, a significantly higher body weight for single kids than twin and triplet were reported by Singh et al (1990,1991), Hussain et al (1992) and Hussain et al (1997) in Black Bengal Goat.
5.2 Reproductive Performances

The body growth, onset of puberty and sexual maturity along with optimum reproductive performances are the manifestation of innumerable metabolic activity of the different systems of the body as a whole. Besides those, proper detection of estrus stage of estrous cycle, pregnancy diagnosis, care of pregnant goat during gestation and after parturition along with more attention needed to neonate and proper health control measures etc. are very much important for the improvement of this Black Bengal breed for higher productivity.

In the present study the age at puberty (309.72 days) in Black Bengal goat found was much higher than the findings of Ahmed (1992) who reported the values as 160.37 ± 23.27 days in the same breed of goat and relatively higher than the findings of Rao et al. (2002) where the values were 238.2 ± 5.2 days in the same breed of goat. The value of other breeds and their crosses was much higher than the present findings except in Boer goat where it was 157.2 days (Greylmg et al., 1990), in Barban as 9.52 ± 1.01 months (Mittal, 1993) and in Kanni Adu goats as 9.38 ± 0.11 months (Thiruvenkadan et al., 2000).

The body weight of the animal under present study was in lower side may be attributed to poor nutrition and inadequate healthcare. Since the body weight of these animals seen lower in side, the activities of the reproductive profiles were delayed and the attainment of puberty at higher age is observed in the present study. Thus the result of the present study was substantiated with the findings of the earlier workers. Moreover, the reproductive performances of Black Bengal Goat were in danger due to irregular breeding by the farmers. The purity of this breed is in danger and the conservation programme is going on.

The average value of body weight at puberty recorded in the present experiment (8.88 ± 0.08 kg) was much lower when compared with the finding of Rao et al. (2002) in Black Bengal Goat. The values in other cross bred animals were also much higher than the values obtained in the present study. No explanations can be offered for these variations; however the differences might be due to variation in the breed, agroclimatic condition and inadequate plane of nutrition. The wide variation of the age at puberty among the different breeds of goats in India might be ascribed to multifaceted reason such as managemental practices, nutrition, climatic changes, genetic pool potentiality etc. While consulting the literature, it was found that the body weight of the goats as...
considered in the present study was much lowered with that of the crossbred goats. Since the body weight is one of the economic traits, this warrants further research to upgrade the body weight looking in to the interest of the marginal poor farmers.

The length of estrous cycle (19.43 days) obtained in the present study was in conformity with the finding of Ahmed (1992) in Black Bengal Goat. Adoption of same managemental system and under similar environmental condition, with that of Myemen Singh, Dhaka could be the prime factors. Similar length of cycle was observed by Barua et al. (2000) in Beetal (20.84 ± 0.07 days), Beetal x Assam local (20.68 ± 0.09 days), in Jamunapan (21.14 ± 0.15 days) by Goel et al. (2003), in Chegu (18.32 days) by Thakur and Singh (2002) and in West African Dwarf breed of goat (20.4 days) by Chibooka et al. (1987).

The length of estrous cycle was almost in uniformity with the findings of earlier workers because of its species specificity. However slight variation was occurred due to agro-climatic condition. The length of estrous cycle in Assam local (Barua et al. 2000, Aziz and Konwar, 1988) and in Malvi local (Qureshi et al., 1991) was found higher in comparison to Black Bengal goat in the present observation. Length of estrous cycle which is genetically predetermined is responsible for this variation as well as differentiating experimental and managemental procedures considered in the present experiment might be the other factor.

The average value of estrous duration was 35.4 ± 1.077 hrs which simulate with the findings of Singh et al. (1997) the results revealed only from nulliparous goats. However the finding did not corroborate with the observation of Ahmed (1992) in the same breed and the lower magnitude of estrous duration recorded by Singh et al. (1986) could attributed the variation of non-genetic factors.

The present finding was higher when compared with the observed values by different workers viz. Aziz and Konwar (1988) in Assam local goats, Qureshi et al. (1991) in local Malvi goats in other Indian exotic breeds as stated in the review of literature except in Jamunapari goats (39.75 ± 1.3) hrs observed by Goel et al. (2003). These differences could be attributed to the variations in breed, climatic conditions, managemental systems and some intrinsic factors.

No seasonality in oestrus has been noticed in present study and this also been reported by Thiruvenkadan et al. (2000) in Kannı Adu goats whereas Singh et al.
(2001) recorded the maximum percentage of oestrus occurrence in Jamunapan goats during May (33.36%) and October (24.91%) followed by June (11.17%), July (10.88%), September (8.45%) and November (6.59%) respectively. This variation might be due to difference in breed and climatic condition.

Though the animals do observe any strict seasonality in oestrus expression yet many of does came to oestrus during the months from May to September with a peak in July in the present study. The availability of sufficient green in the pasture and environment may have favoured for large number of animals to come to estrus during those months. The seasonal influence on oestrus frequency was also reported by Suresh Kumar et al. (1989) in Surti and Marwan breeds of goat, Mehta et al. (1990) in Surti and Marwan goats, and Singh et al. (2002) in Jamunapan goat respectively.

The overall mean age at first kidding (458.39 days) recorded in the present study corroborates the findings of Ray et al. (1990), Singh et al. (2000), Rao et al. (2002) in Black Bengal Goat but the value was higher as reported by Ahmed (1992) and was lower reported by Singh et al. (1987), Pottanaik and Mishra (1985) in Bengal goats. Variations in climatic conditions and management practices during the experiments might be the possible prime factors for varied results obtained in references. The mean values of age at first kidding in other breed and cross breed except New Guinea (420-504 days) were higher from the present study. The variation in climate and breed could also be the contributing factors for these differences. Significant effect of season on the age at first kidding was also observed by Ray et al. (1990) which simulated with the present observation.

The overall mean body weight at first kidding found in the present study was lower than the values reported by Rao et al. (2002) and Singh et al. (1987) in Black Bengal Goat which could be due to climatic differences between the regions as well as plane of nutrition under this experiment. However, values in other cross breeds like Ganjam X Black Bengal, and Black Bengal X Ganjam were reported higher (Rao et al., 2002) than the present findings. The breeds under the experiment, climatic situation of the study area and method of managerial practices possibly have been the responsible factors for such differences. As the animals were attaining puberty at higher age and lower body weight the result of age at first kidding and weight at first kidding is reflected.
Gestation period observed in the present study was in conformity with the findings of Ahmed (1992) where 147 days on gestation period was recorded in Black Bengal Goats. Gestation period as reported by Rao et al., (2002) 146.27 days and 142.4 days reported by Singh et al., (1987) in Black Bengal goat were lesser than the present findings. Environmental factors might be the cause of this variation. Gestation period recorded in other breed and cross breed were also in agreement with the findings of the present experiment. Therefore, it could be concluded from the present observation that the breed variation had no such influence on the gestation period which become to be species specific.

Present finding also indicated that kidding season (kidding distribution) occurred throughout the year while in Jamunapari goat it differs (Roy et al., 2001). Kidding distribution was highest (48.96%) in winter followed by summer (28.12%) and monsoon (22.92%) season in the present findings and revealed a significant (P<0.01) seasonal effect on this trait. Kidding distribution in the present study corroborated the finding of Thiruvenkadan et al. (2000) where the maximum kidding occurred during winter (42.69%). The finding was also in agreement with the observation of maximum kidding in winter months by Markandeya and Devangare (1997) in Osmanabadi goats (24.62%) and by Galina et al (2000) in Mexican dairy goats (59%). But the result was not in conformity with the findings of Thakur and Singh (2002) in Chegu goats having no kidding during winter, while of Roy et al. (2001) in Jamunapan goats where kiddings were maximum in monsoon (47.88%) followed by winter (39.07%). The variations in breed of goat, climatic conditions of the experiments and managemental practices of animals rearing could be attributed to the differences.

Present study also carried out on birth pattern in Black Bengal goat where the percentage of multiple births was in conformity with the findings of Ghosh and Das (2000) and Ghosh and Das (1997). The observation however varied with the findings of Verma et al. (1991), Singh et al. (1987) and Husain et al. (1990) in the same breed. These variations might be due to difference in climatic condition, plane of nutrition and managemental practices under which the experimental animals were being maintained. The results regarding this trait in other breed except Kann Adu were not in agreement with the present finding. The multiple birth patterns in Kann Adu as reported by Thiruvenkadan et al. (2000) were found to be similar with the present findings.
The results on litter size obtained was in close conformity with the finding of Singh and Singh (1999) and higher than the value (1.26) reported by Verma et al (1991) in Black Bengal goat. This difference might be due to variation in climatic condition, feeding of balanced ration well supplemented with vitamins, common salt, macro and trace minerals and other managemental practices. Amongst other breed the value recorded by Thiruvenkadan et al (2000) in Kannu Adu goats of Tamilnaru was in close agreement with the present finding and this might be due to higher fecundity rate of this breed. It was higher (2.63) in Saanen X Malaban goats (Singh and Sahni, 1989) and was lower in rest breeds and cross breeds as reported by different workers than the present finding. The variation in the genetic constitutions of the goats under present study, climatic position of the area of experimentation and practices of managemental procedure could be the contributing factors for such differences.

About sex ratio, the present findings were in agreement with the finding of Verma et al (1991) in Black Bengal goat. The result regarding the birth percentage of male kids was higher than the findings of Ghosh and Das (1997) and Ghosh and Das (2000) in Black Bengal goat which might be due to less number of observations. The values of sex ratio in Assam local, Beetal X Assam local, Andhra Pradesh local observed by Barua et al (2000), Aziz and Konwar (1988), Naidu (1992) were almost similar with the present finding.

Kidding rate was maximum than the values obtained in other Indian and exotic breeds reported by different workers mentioned in the review of literature. These differences may be explained as the attributes of breed, climate and feeding system and variation in number of observation.

The overall mean service period obtained in the present study (63.69 days) was in close conformity with the findings of Ahmed (1992), Singh et al (1986) and Rao et al (2002). However in companson with the present findings lower values were recorded by Husain et al (1990) and higher value was recorded by Singh et al (1987) and Singh et al (2002) in Black Bengal goat. These variations might be due to differences in climatic situations and managemental practices, on which the animals under different studies were reared up. The findings regarding service period in other breed and cross breed were higher, except in Beetal, Assam local goat and Beetal crosses with Assam local as reported by Barua et al. (2000). These differences were observed due to varied genetic constitution of the type of animals. The variation of
service period sometimes observed for variation in involution of uterus which might be due to nutritional insufficiency, difficult birth, parity and litter size.

The present finding on Kidding interval (212.55 days) was in close agreement with the findings of Ahmed (1992) and Rao et al. (2002), lower than the value reported by Singh et al. (2000) and higher than the value observed by Ray et al. (1990) in Black Bengal goat. The findings regarding this trait reported by other workers in other breed and cross breed were higher than the finding of present study except in grazing goats of New Guinea where the interval was 223 to 305 days (Holmes and Mott, 1989). The significant effect of season on the kidding interval in Black Bengal goat was observed in the study. Similar types of observations were also found by Ray et al. (1990).

Regarding conception, the overall finding of the study is in conformity with the results obtained by Mittal (1991) in Kutchi (91.66%) and Marwari (87.50%) and by Barua et al. (2000) in Assam local (92%) and Beetal X Assam local cross breed. The conception rate recorded in Osmanabadi by Patil et al. (2000) was much less than the present value. Amongst breeds of other countries, the values reported by Ojaili (1995) in Dhofan goats sired by Anglo Nubian buck (65.0%) and by Rafiq et al. (1990) in Khurasani goat (79.0%) were very much lower than the present finding whereas the findings recorded in Dhofan goats sired by Dhofan buck (Ojaili, 1995) and in Kajthi breed (Rafiq et al., 1990) were in close conformity with the present value. These variations were occurred due to varied genetic potential of tropical zone having herd humid atmosphere and of temperate region with a dry and extreme cold weather.

Reproductive failure faced in the form of abnormal kidding due to abortion and still birth in the present finding differ with the findings of Singh et al. (1987) in Black Bengal Goat where incidences were 1.69, 4.76 and 3.13 percent in summer, monsoon and winter respectively. The climatic and managemental practices variation could be the contributory factors for such differences. The result obtained in Boer, exotic goat breed by Seabo et al. (2008) was much lower (0.66%) than the present value (2.04%). This difference might be due to variations in genetic constitution, geographical areas, and managemental practices followed. The value in local Malvi goats (15.0%) reported by Qureshi et al. (1991) was much higher than the present findings.

The overall still birth percentage found in this study was 4.95% (table) whereas it was 6.9% in summer, followed by 4.35% in monsoon and 4.08% in winter respectively. Present result simulate with the findings of Singh et al. (1987) in BBG at monsoon.
but differences were observed in other two seasons. The reasons of such differences might be due to non-genetic situations such as managemental practices and climatic variations. The value (2.78%) recorded by Seabo et al. (2003) in Boer goat was lower than the results of present study but the value obtained by Qureshi et al. (1991) in local Malvi goats, simulated the present findings.

The total abnormal kidding percentage due to abortion and still birth together recorded in the present study was 6.8%. It was higher than the value reported by Kumar et al. (2001) in Jhakrana goats. The value (31.5%) recorded by Singh et al. (1986) in Black Bengal goat was much higher than the present findings. Such high incidences probably due to non-genetic factors, of which health hazards and managemental problems were prime contributors.

The values reported by different workers in other Indian breeds were also much higher than the present findings. However, Sangamnen goats showed high incidences of still birth during each seasons of autumn (43.6%), winter (23.65), rainy (20.2%) except summer (1.8%). Bakshi et al. (1987) Such type of high incidences might be due to major set back in health managemental system besides other contributory factors.

**5.3 Haemogram (Hb, PCV, RBC, WBC, DLC)**

The Haemoglobin values found in the present study in both the groups of animals were lower than the results reported by Bhattacharya et al. (2002) in cross breed pregnant and non-pregnant animals wherein significant difference was present amongst the groups. It might be due to variation in climatic conditions as well as plane of nutation and the breeds of studied animals. The values obtained in the experiment were all most similar with the result recorded by Kundu et al. (1991) in Black Bengal goats but the gestational status of the animals were not defined, by Kaushish et al. (2000) in Jhakrana, Kutchi, Marwan and Sirohi where the observation was made on the day of kidding, by Sandhu and Randhawa (1999) in cross breed goat having undefined state of gestational condition.

The PCV value recorded in this study is in close agreement with Bhattacharya et al. (2002) in case of pregnant crossbred goats but was much higher in case of non-pregnant goats. The PCV value of pregnant Goats was in close conformity with that of non-pregnant goats as obtained by Kundu et al. (1991) in Black Bengal goats of 2 years age where the gestation statuses were not clearly mentioned. Whereas the PCV
value reported by Sandhu and Randhawa (1999) in crossbred goats having undefined gestational condition was very much higher than the present results in both the groups.

The values regarding RBC found in both the pregnant and non-pregnant groups were much lower than the findings of Bhattacharya et al. (2002) in case of crossbred (Beetal × Assam local) goats. The present finding in both the groups were corroborated with the result obtained by Kundu et al. (1991) in Black Bengal goats of 2 years age and Sandhu and Randhawa (1999) in cross breed goats.

The WBC values observed in present experimental goats were higher than the values reported by Bhattacharya et al. (2002) in case of cross breed pregnant and nonpregnant goats respectively. Present value was found lower than the value reported by Kundu et al. (1991) in Black Bengal goat and higher than the value recorded by Sandhu and Randhawa (1999) in cross breed goats. The result of differential leucocyte count under present study was varied with the findings of Sengupta and Basu (2008) because they observed the animals with experimental sarcoptic mange infection.

These variations might be attributed to difference in geographical condition, optimum nutrition level maintained in the goat feed and genetic constitution of the animal.

5.4 Serum Glucose, protein and Cholesterol

In the present study, slight lower values of serum glucose in pregnant female than nonpregnant female were reported, however, the difference was non significant. The results were in agreement with those of Purohit et al. (2000) in ewes. The decrease in the concentration of serum glucose in gestation could be due to higher energy requirement for fetal metabolism and/or the progressive appearance of fetal insulin.

The mean values of serum protein in pregnant and non-pregnant goats were 7.22 ± 0.9 and 7.92 ± 0.12 (Table 14) respectively. Significant (P<0.001) variation of serum protein was present between pregnant and non-pregnant goats. Obtained values were nearer to the value reported by Nazifi et al. (1999) and Ghosh et al. (2002). But these values were slight higher than the values obtained by Kaneko et al. (1997). The serum protein value in pregnant animal was lower than non-pregnant because of the requirement of protein is more for fetal requirement.
The normal mean values of serum cholesterol in pregnant and non-pregnant goats were 63.42 ± 0.6 and 63.33 ± 0.67 (Table 14) respectively. All the values were slight lower than values reported by Juma et al. (2000) in healthy native does of Iraq and Kaneko et al. (1997) in healthy goat. Results were in agreement with the values reported by Kalita et al. (2000) in healthy control Black Bengal goat. Non-significant higher values of serum cholesterol in pregnant female than non-pregnant female were in agreement with Krajnicakova et al. (1993) in ewes.

5.5 Macromineral (calcium, magnesium and phosphorus)

The average value of serum calcium present in pregnant and non-pregnant goats was almost similar with the finding of Bhattacharya et al. (1995) in Assam local goats at mid-pregnancy and non-pregnancy stages. The serum calcium level obtained in this study was higher than the results found in Jhakrana and Kutchi, and corroborated with the results observed in Marwari and Sirohi as reported by Kaushish et al. (2000). But the findings are much lower than observation by Patel et al. (1992) in pluriparous Surti and Marwan goats.

The serum magnesium level observed in pregnant and non-pregnant goats in present experiment was in close agreement with the finding of Kaushish et al. (2000) in different larger goats breeds of Rajasthan on their kidding only and Bhattacharya et al. (1995) recorded in Assam local goats at the stage of mid-pregnancy and non-pregnancy. Where as the present value was almost similar with the results reported by Jain et al. (2000) in Jamunapari in different stages of physiological condition.

The serum phosphorus concentration in serum found in the study in non-pregnant group was in close conformity with the finding of Bhattacharya et al. (1995) in Assam local goats but the value in pregnant animals was much lower than the result in Assam local goats. Where as the serum Phosphorus level obtained in the experiment in both the groups were much higher than the results observed in the Chegu goats (Sharma et al., 1990), in Surti and Marwari on the first day of oestrous cycle (Mehta et al., 1991), in Jamunapari goats at different stages of physiological condition i.e., growing, pregnant and lactation (Jain et al., 2000) and in Jhakrana, Kutchi, Marwari, and Sirohi goats on the day of their kidding (Kaushish et al., 2000). These differences due to varied breed of animals, plane of nutrition offers to the animals and geographical areas of experimentation could be the attributing factors for such changes in the level of macro minerals like calcium, magnesium and phosphorus.
5.6 Micro mineral (copper, iron, zinc and manganese)

The copper level observed in this study in pregnant goats was in close agreement with the finding of Bhattacharya et al. (1995) in Assam local goats during mid-pregnancy but the level in case of non-pregnant goats was lower than the value in Assam goats. The serum copper concentration reported by Mehta et al. (1991) in Surti goats on the first day of first estrus was much lower than the value found in non-pregnant group of goats studied under the present experiment whereas the value was much higher in Marwari goats than the present value in non-pregnant goats.

The findings for serum copper level by Jain et al. (2000) in Jamunapari goats at different physiological stages viz. growing, pregnant and lactation, by Bhattacharya et al. (1996) in Assam goats having undefined physiological status were lower than the value found in pregnant and non-pregnant goats under present study.

The iron concentration in serum of pregnant and non-pregnant goats observed in this study was lower than the result reported by Bhattacharya et al. (1995) in Assam local goats during mid pregnancy and non-pregnancy. The finding of the present experiment in case of non-pregnant groups of goat was in close agreement with the serum iron value of pre-pubertal goats (Bhattacharya et al., 1996) whereas the present value in pregnant goats was lower than the value obtained by the same author in pubertal goats.

The serum zinc level, found in the present study, in pregnant animals, was almost similar and in case of non-pregnant groups, was in close agreement with the findings of Bhattacharya et al. (1995) in goats at the mid pregnancy and non-pregnancy stages respectively, where as present value in pregnant group of animal was higher than the serum zinc concentration of non-pregnant goats at the pre-pubertal and post-pubertal condition, in non-pregnant group of animals it was almost similar with the report of Bhattacharya et al. (1996). The present finding in pregnant and non-pregnant goats was lower than the values obtained in Jamunapari goats in winter season at growing, pregnant and lactation stages but were closely related to the values in the same breed of goats in the autumn at different stages as earlier (Jain et al., 2000).
There is scanty reference regarding this type of parameter. The serum level of manganese in pregnant and non-pregnant goats studied under the present experiment was much higher than the serum Manganese concentration reported by Jain et al. (2000) in Jamunapan goats in difference physiological stages viz. pregnant and non-pregnant (growing and lactation) during winter as well as in autumn season.

The variations in breed of animals, plane of nutrition and agro climatic positions where the experiments were studied could be the contributing factors for such variations in findings of level of trace minerals like copper, iron, zinc and manganese.

5.7 SGOT, SGPT and Serum Acid & Alkaline Phosphatase Activity

The serum transaminase values observed in Black Bengal goat by Kalita and Mahapatra (1998) showed higher level at 3, 5 and 6 months when compared with the present study. Higher level during the first phase of growth in SGOT may be due to higher metabolic activities in the goat and this is in similarity with Mathai and Nirmalan (1992) in Alpine Malaban crossbred goats and Sharma and Bisoi (1995) in dairy calves.

Following a decreasing trend in the overall value from 1st to 9th month, the average serum acid phosphatase level increased at 10 month of age, while in alkaline phosphatase there was a decreasing trend from 1st to 9th month and then increased up to 12 month. It was observed that there was a decrease in serum alkaline phosphatase activity with advancing age till maturity and this was in agreement with Allcroft and Folley (1941) in cattle and sheep, Roussel and Stalcup (1966) in male calves, Adaval et al. (1969) in goat Agergaard and Larsen (1974) in cattle, Kalita and Mohapatra in Black Bengal goat, Mishra (1999) on Black Bengal goat.

Highest SGOT level at ‘0’ day of oestrous cycle was in agreement with Jo (1981) in Korean Native calves, Jindal et al. (1988) in Buffalo calves, Mathai and Nirmalan (1992) on Alpine-Malaban crossbred goat and Ishwar (1994) on Black Bengal goat.

The activity of serum acid and alkaline phosphatase activity increases from 0-14 day and then reduced till 18th day. Same findings were observed by Mathai and Nirmalan (1992) in Alpine-Malaban crossbred doe.

Alkaline phosphatase level was higher in luteal phase than follicular phase and the same was in agreement with Ishwar (1994) and Mishra (1999) in Black Bengal and Deka and Baishya (1999) in Assam Local goat.
Acid phosphatase activity increases in pregnant than non pregnant group, which was in agreement with Murtuza et al (1980) in cattle and Mehta et al (1985) in buffaloes. Mehta et al (1989) observed that mean value of alkaline phosphatase decreases progressively from 1st trimester of pregnancy till post partum estrus in buffaloes. The findings for higher values of alkaline phosphatase in pregnant goat were in agreement with Verma and Tyagi (1973) on Indian breed of goats.

The enzyme activity during gestation was observed to be higher than non pregnant animals and it may be due to metabolic rate of the foetus resulting into increase in enzymatic activity in advancing stage of gestation. The present finding is in agreement with Boots et al (1970) in cattle, who observed the same in transaminase activity.

Therefore, from the earlier observations found in the present study there was a marked variation of serum transaminase in different physiological stages. Average serum phosphatase level varied markedly during the stages of growth. There was highly positive correlation between the enzymes and both the enzymes had highly negative correlation with body weight of the animal during growth period. It was also observed that both the enzymes varied markedly between the stages of oestrus cycle and there was a highly positive correlation among them during this period. The average serum alkaline phosphatase activity varied markedly between various physiological states whereas acid phosphatase did not. Both alkaline and acid phosphatase might serve as useful indicators of growth and levels of oestrogen and progesterone in the serum. Alkaline phosphatase might serve as a tool for pregnancy diagnosis.