SONOGRAPHIC DETERMINATION OF FETAL AGE IN SANGAMNERI AND OSMANABADI GOATS

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ABSTRACT

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Fetometry by real-time ultrasonography proved to be reliable method for predicting gestational age in Sangamneri and Osmanabadi goats utilizing biometric parameters viz. Bi Parietal Diameter (BPD) of fetus and Placentome Diameter (PL).

Key words: Fetal age, Bi Parietal Diameter, Placentome Diameter, Sangamneri, Osmanabadi, Goats

Breeding dates are generally unobserved or unrecorded, making fertile breeding impossible to determine in most flocks of goats. Many goats are presented with inaccurate or with vague or uncertain history of breeding. In such cases owners would benefit greatly in terms of feeding and kidding management if accurate prediction of pregnancy, kidding dates and fetal numbers can be given. Sangamneri and Osmanabadi are well recognized dual purpose goat breeds from Maharashtra state. There is little information in regards to relationship between pregnancy related structures and pregnancy stage. Accurate information on the stage of gestation, kidding dates would be useful for timely dry off lactating females and to monitor females near term. Ultrasonic measurements of bi parietal dimension of fetus and placentome diameter in pregnant goats are useful in predicting the age of fetuses and stage of pregnancy in goats (Doize *et al.* (1997), Abdelghafar *et al.* (2007), Abdelghafar *et al.* (2011), and Airina *et al.* (2011). The relationship of the gestational age with the measurements of bi parietal diameter (BPD) of fetus and measurement of placentomes (PL) during pregnancy in different breeds of goat was analyzed.

Twenty goats of Sangamneri (10) and Osmanabadi (10) breeds aged between 2 - 4 years belonging to All India Coordinated Research Project on Goat Improvement, Dept of Animal Science and Dairy Science, Mahatma Phule Agricultural University, Rahuri College of Veterinary Science, Shirval Dist Satara were used for this study. Estrus was induced in all the goats using hormonal synchronization protocols and bred during induced estrus. The trans-abdominal ultrasonography was performed on day 88 (Sangamneri goats) and on day 81 (Osmanabadi goats) post mating using a real time B mode scanner (esaote Piemedicals,Holland) equipped with frequency (3.5-5) MHz convex transducer. All the goats were scanned in dorsal recumbency. Each horn was scanned separately by tilting the does to the right and left side. Clipping of an area of 100-200 sq. cm on right side, just above the udder was done in some cases. The entire reproductive tract was inspected by moving the probe gently in different directions and rotating it 180° clockwise and counter clockwise.

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The fetal structures were identified and the relevant images / events during scanning were frozen.

Measurement of Bi Parietal Diameter (BPD) and Placentome Diameter (PL) were taken as follows:

Bi Parietal Diameter (BPD) was measured when fetal head could be visualized in transverse plane. The measurements were taken when the head was oval in shape. Falx cerebri mid line should divide the brain into two similar hemispheres. The measurements were taken from the outer distal calivarium to the inner proximal calivarium. (Fig. 1).

The sonographic fetal age was calculated using bi parietal diameter of fetus as per formula given by Abdelghafar *et al.* (2007)

Formula :BPD = 0.055 X –1.431

Where- BPD is Bi parietal diameter of fetus in cm

X is estimated gestational age (EGA) in days.

In each doe, PL was taken 2-3 times and the mean of all the measurements was used for calculation of age of gestation. Placentomes were "Saucer or Doughnut" shaped or "C" shaped, depending upon the angle of scanning (Fig. 2). The placentomes, selected for measurements were as round with well defined contour.

The formula used for calculating fetal age using placentome diameter (Doize, *et al.*, 1997) was as follows-

Formula: GA = 28.74+1.80 PL

Where GA is gestational age in days

PL is placentome diameter in mm

Ultrasonographically measured bi parietal diameter (BPD) and placentome diameter (PL) were correlated with observed gestational age.

In Sangamnri goats (n=10), the BPD of fetus ranged from 2.74 to 3.50 cm (3.29 ± 0.07 cm) and sonographic fetal age calculated as per formula given by Abdelghafar *et al.* (2007) was 85.99 ± 1.29 days.

The PL in Sangamneri goats ranged from 3.02 to 3.63 cm (3.24 ± 0.05 cm) with estimated fetal age of 87.00 ± 0.94 days as per formula given by Doize, *et al.* (1997)

An observed gestational age was 88 days in Sangamneri goats.

Bi Parietal Diameter (BPD) Placentome Diameter (PL) in Osmanabadi Goats:

In Osmanabadi goats (n=10) the BPD of fetus ranged from 2.60 to 3.80 cm (3.03 ± 0.12 cm) and fetal age calculated was 81.03 ± 2.16 days.

The PL ranged from 2.33 to 3.23 cm (2.74 ±0.09 cm) with estimated fetal age of 78.08 ± 1.60 days.

An observed gestational age was 81 days in Osmanabadi goats.

The results in the present study suggest that fetometry by real-time ultrasonography was proved to be reliable method for predicting gestational age in Sangamneri and Osmanabadi breeds of goats utilizing biometric parameters like bi parietal and placentome diameters.

REFERENCES

Abdelghafar R.M., Ahmed B.H., and Bakhiet A.O (2007) Ultrasonic measurements of crown rump length and bi parietal diameter to predict gestational age in Saanen goats. *J. Anim. Vet. Adv.*, **6** (3):454-457

Abdelghafar R.M., Ahmed B.H., Ibrahim M.T.and Mantis P.(2011) Prediction of Gestational Age

by Transabdominal Real-Time Ultrasonographic Measurements in Saanen Goats (*Capra hircus*) *Global Veterinaria* **6** (4): 346-351

Airina R.K.R.I, Nizam A.R.M., Abdullah R.B. and Khadijah W.E.W.(2011) Using fetal heart size measured from ultrasound scanner images to estimate age of gestation in goat. *J. Anim.Vet. Adv.,* **10** (19):2528-2540

Doize F., Vaillancourt D., Carabin H. and Belanger D. (1997) Determination of gestational age in sheep and goats using transrectal ultrasonggraphic measurement of placentomes *Theriogenology*, **48**:449-460

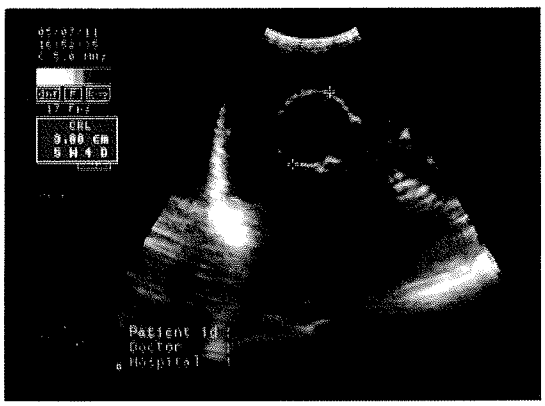

Fig. 1. Ultrasonic Bi parietal diameter of fetus in Sangamneri goat at 88th day of gestation

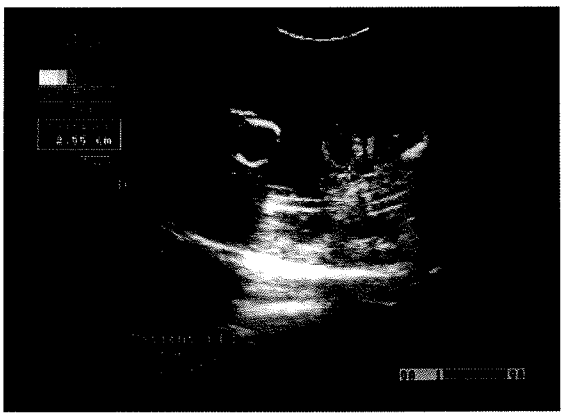

Fig. 2. Ultrasonic Placentome diameter in Sangamneri goat at 88th day of gestation