Estimation of gestational age in Shami goats based on transabdominal ultrasonographic measurements of fetal parameters

R.S. Muhammad [ID] and D.M. Aziz [ID]

Department of Surgery and Theriogenology, College of Veterinary Medicine, University of Mosul, Mosul, Iraq

Abstract

Estimated gestational age is essential for breeding farm animals because pregnant females require special care and nutrition, which varies according to gestation. The study aimed to estimate the gestational age of Shami does by transabdominal ultrasonographic measurement of fetal parameters. Thirty-three Shami does aged 2-2.5 years with confirmed conception dates were used. The does were examined in a standing position using a transabdominal 3.5 MHz convex sector probe of real-time ultrasonography. The does were examined weekly starting on 21 days of pregnancy until parturition. Measurements of the fetal parameters that include; the crown-rump length, head diameter, chest diameter, trunk diameter were obtained from the ultrasonographic images using the software Screen Calipers. Results showed that the gestational sac and embryos were observed first on 21 and 35 days of pregnancy. The litter size of pregnant does range between two and three kids. Crown-rump length ranged between 24.68 ± 1.32 - 71.71 ± 1.84 mm on 41-60 days. The head diameter was 15.63 ± 0.82 - 45.04 ± 0.92 mm on 41-120 days. Chest diameter was 11.52 ± 0.84 - 56.35 ± 0.93 on 51-110 days, and trunk diameter was 10.69 ± 0.85 - 57.38 ± 0.85 mm on 41-130 days of gestation. The highest positive correlations were obtained between the gestational age chest diameter ($r=0.935$), crown-rump length ($r=0.917$), head diameter ($r=0.917$) and trunk diameter ($r=903$). In conclusion, transabdominal ultrasonography is a practical method for pregnancy diagnosis and embryo monitoring in Shami goats. Also, it is reliable to estimate gestation age starting on 41 days of pregnancy. The chest diameter was the best fetal parameter, but trunk diameter can be used for the longest period to estimate the gestational age of Shami goats.

Introduction

Shami goats, also known as Damascus goats, are a native breed of Syria and other nearby countries. Shami goats are one of the vital farm animals that are bred primarily for milk and meat production. They are characterized by high milk production and a high rate of twines (1). Pregnancy diagnosis and determination of the pregnancy age are crucial for breeding farm animals since pregnant females require special care and nutrition, which varies depending on the duration of pregnancy. Another importance of the determination of the age of pregnancy is to predict the delivery time to avoid

problems that occur during the parturition and thus reduce the fetal loss due to dystocia (2). The age of pregnancy in farm animals is estimated depending on the time of insemination, which is considered the zero-day of pregnancy (3). This method is more accurate than other methods to determine the age of the pregnancy. However, the method adopted for bred of goats remains rudimentary in many countries, including Iraq, since it does not adopt the recording system and record the date of insemination. Therefore, determining pregnancy age in such animals requires a reliable method to obtain accurate results. Currently, ultrasound imaging technology is considered a

reliable method with high success in diagnosing pregnancy. This method provided the possibility of monitoring the uterus and fetus at different periods of pregnancy and obtaining the uterine and fetal measurements (4). Several studies have adopted ultrasonography to estimate the pregnancy age in different breeds of goats. These measurements include; uterine diameter, crown-rump length, fetal head diameter, trunk diameter, measuring the dimensions of the heart, and diameter of the umbilical cord (5-11). In Iraq, minimal studies have adopted ultrasonography to determine pregnancy age in local Iraqi goats (12,13), and only one study was carried out to detect the single and multiple pregnancies according to the ultrasonographic measurement of placentomes in Shami goats (14). There is no study conducted to estimate pregnancy age in Shami goats.

The study aimed to estimate gestational age of Shami does by transabdominal ultrasonographic measurement of fetal and maternal parameters.

Materials and methods

Animals

This study was performed in Sardasht village located in Erbil city northern Iraq. Thirty-three cyclic Shami does were used in this study. The age of does was 2-2.5 years, and they have 1-2 previous pregnancies. The animals are kept in one farm under the same management, environment, and feeding system. All does were labeled to enhance recording and measurements.

Estrus was synchronized using a polyurethane vaginal sponge soaked with 60 mg of Medroxyprogesterone acetate/sponge (Esponjavet©, Laboratorios Hipra, S.A., Spain) for 14 days. After 14 days, the sponges were removed, and 500 IU of serum gonadotrophin (PMSG) (Oviser©, Laboratorios Hipra, S.A., Spain) was injected intramuscularly. Estrus was detected within 72 hours. All does were mated at least one time with fertile males. The date of first mating was considered the first day of gestation.

Ultrasonography

Transabdominal ultrasonography was performed according to the previously described method in goats and sheep without fasting or shaving (7). The does were examined in standing position using a real-time ultrasound scanner ECM- iMAGO (iMAGo, ECM, France) fitted with a 3.5 MHz convex array transducer. Ultrasound transmission gel was used as a coupling medium. The probe was applied to the hairless area immediately cranial to the udder (15).

The does were examined weekly starting on 21 days of pregnancy until parturition. At each time of examination and for each doe, numerous ultrasonographic images of the fetus and uterus were obtained and recorded for later analysis and measurement.

Measurements of fetal and maternal parameters

The fetal ultrasonographic images were processed to obtain the measurements of the parameters using the software Screen Calipers (Version 4.0, ©2006, Iconico, Inc., http://www.iconico.com/caliper/). The software was calibrated through an image of the ultrasonic device with known distances in millimeters (Figure 1). After that, the measurements of fetal parameters that include; the crown-rump length, head diameter, chest diameter, and trunk diameter (Figure 2-5) were recorded in millimeters (16).

Data analysis

All measurements were in millimeters (mm). The values of all parameters were presented as mean + SE. The relationship between the gestational age and the studied parameters was plotted as an X-Y scatter chart with linear regression and expressed as straight-line equations using the Microsoft Excel application (Microsoft Office Professional Plus 2016). Simple regression equations were established, the gestational age was calculated according to the formula $y=ax+b$, where y = gestational age, a = predictors (constant), x = measured value, and b = dependent variable. The correlation coefficient between the gestational age and parameters was calculated using SigmaStat (Jandel scientific software V3.1). The results were considered significant if $P<0.05$.

Figure 1: Calibration of the Screen Caliper software through an image of the ultrasonic device with known distances in millimeters.

Figure 2: Measurements of the fetal crown-rump length in pregnant Shami doe using the Screen Caliper software.

Figure 4: Measurements of the fetal chest diameter in pregnant Shami doe using the Screen Caliper software.

Figure 3: Measurements of the fetal head diameter in pregnant Shami doe using the Screen Caliper software.
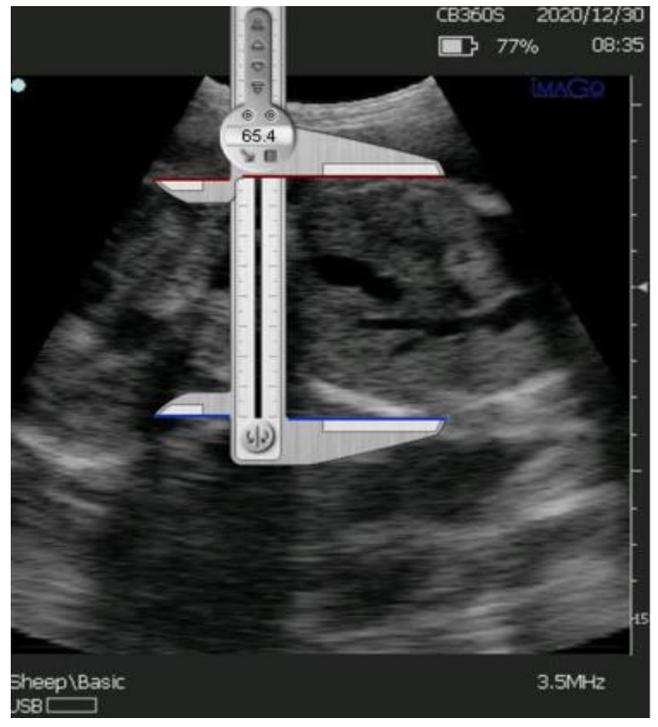

Figure 5: Measurements of the fetal trunk diameter in pregnant Shami doe using the Screen Caliper software.

Results

Estrus synchronization and pregnancy diagnosis

After injection of PMSG, all does exhibit estrus within 72 hours. All mated does were pregnant as confirmed at kidding. The first sign of pregnancy was the appearance of a gestational sac, which was circular or an elongated anechoic structure located in the uterus cranial to the bladder. At the same time, the embryos were observed as an area of high echogenic density located on the gestational sac (Figure 6). The gestational sac was detected first on day 21 of gestation, and the first time observation of the embryos was on 35 days of pregnancy. The litter size of pregnant does range between two and three kids.

Figure 6: Ultrasonic image of pregnant Shami doe showing gestational sac and embryo.

Fetal parameters
Crown-rump length

The first measurement of crown-rump length was captured at 41 days of pregnancy, while the last ability to get the crown-rump length was at 60 days of pregnancy. At 41-45 days of gestation, the value of crown-rump length was 24.68 ± 1.32 mm. The crown-rump length was increased to 71.71 ± 1.84 mm at the 56-60 days of gestation (Figure 7).

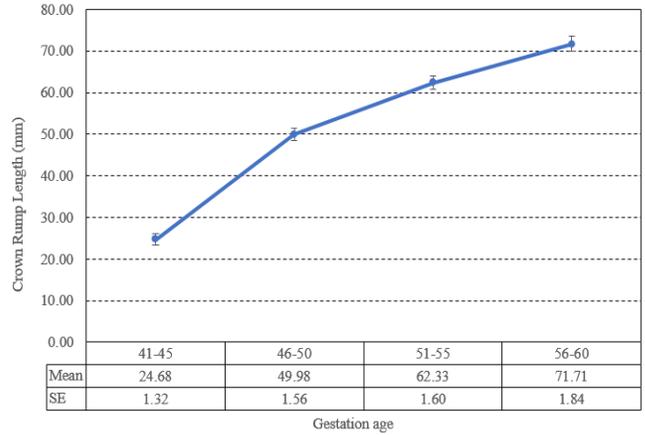|	41-45	46-50	51-55	56-60
Mean	24.68	49.98	62.33	71.71
SE	1.32	1.56	1.60	1.84

Figure 7: Measurements (mm, mean $\pm$ SE) of the fetal crown-rump length obtained by transabdominal ultrasonography during the gestation period of Shami goats.

Head diameter

The results show that the head diameter can be measured from 51-120 days of pregnancy (Figure 8). The mean head diameter was 15.63 ± 0.82 mm at 51-60 days of gestation. This head diameter was increased to 45.04 ± 0.92 mm at 111-120 days gestation.

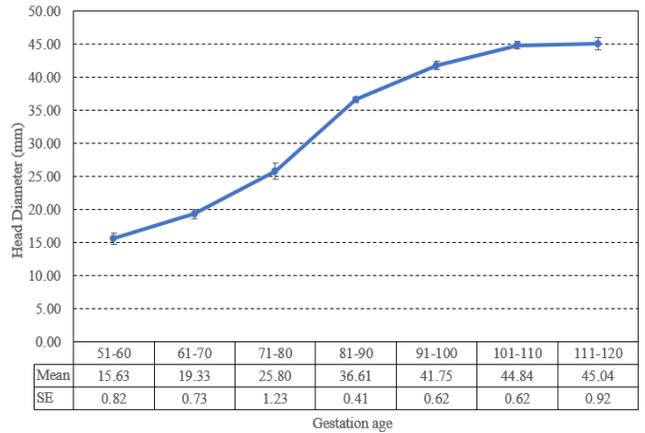|	51-60	61-70	71-80	81-90	91-100	101-110	111-120
Mean	15.63	19.33	25.80	36.61	41.75	44.84	45.04
SE	0.82	0.73	1.23	0.41	0.62	0.62	0.92

Figure 8: Measurements (mm, mean $\pm$ SE) of the head diameter obtained by transabdominal ultrasonography during the gestation period of Shami goats.

Chest diameter

The chest diameter was also one of the fetal parameters to estimate the gestation age in does. Figure 9 shows an apparent increase in chest diameter. It was 11.52 ± 0.84 on 51-60 days of gestation and increased significantly to reach 56.35 ± 0.93 on 101-110 days of gestation.
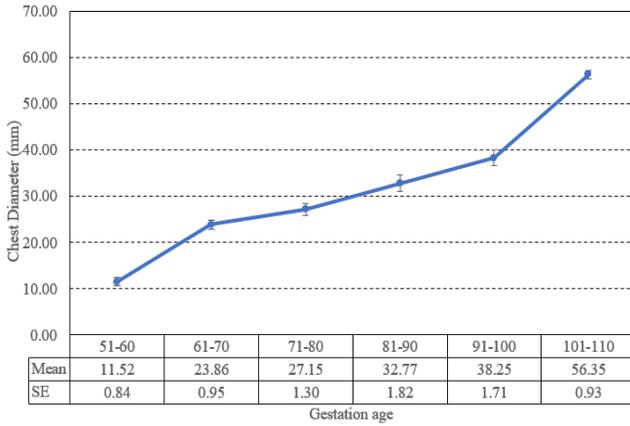
Figure 9: Measurements (mm, mean ± SE) of the chest diameter obtained by transabdominal ultrasonography during the gestation period of Shami goats.

Trunk diameter

The changes in trunk diameter during the gestation period are shown in Figure 10. The value of trunk diameter was 10.69 ± 0.85 mm on 41-50 days of gestation. The value of this parameter was increased gradually until the 121-130 days of gestation to reach 57.38 ± 0.85 mm.
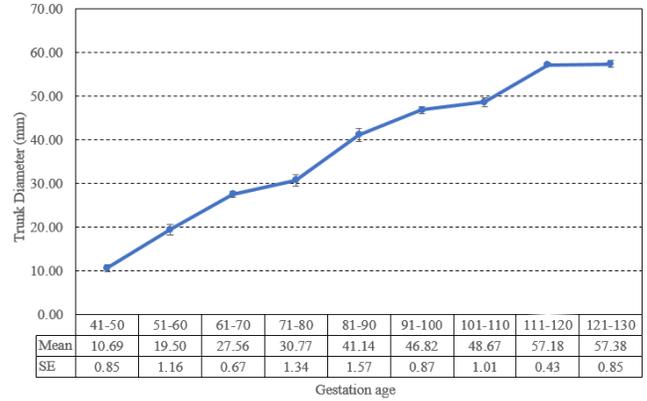

Figure 10: Measurements (mm, mean ± SE) of the trunk diameter obtained by transabdominal ultrasonography during the gestation period of Shami goats.

Estimation of gestational age

The relationship between the gestational age and the measurements of the fetal parameters are shown in Figure 11. The regression line equations, squares of the correlation coefficient, and P values of these relationships were summarized in Table 1.
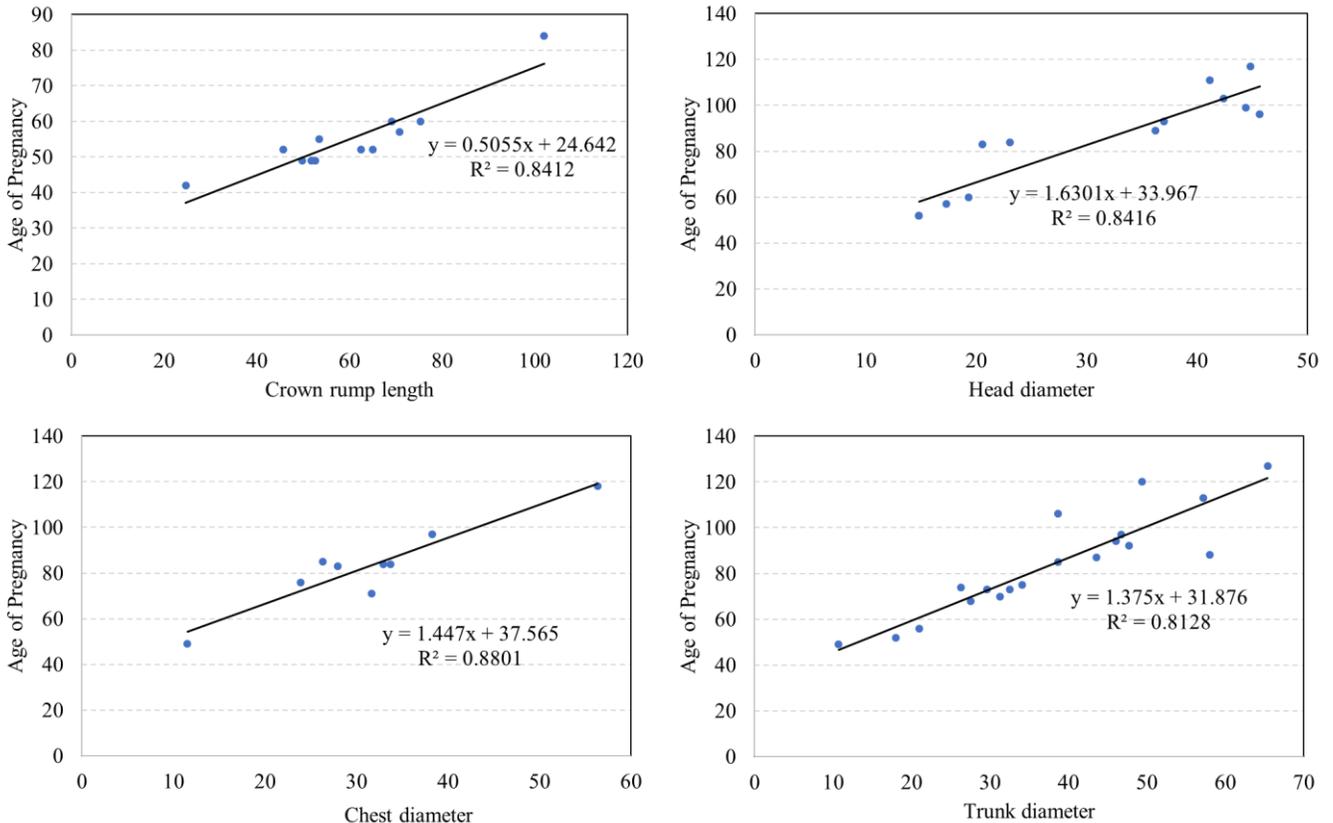

Figure 11: The relationship between the gestational age and the measurements of the fetal parameters in pregnant Shami does.

The study showed that all the measurements were highly significant positively correlated with gestational age (P<0.01). The highest positive correlations were obtained between the gestational age and the measurements of chest diameter (r=0.935), crown-rump length (r=0.917), head diameter (r=0.917), and trunk diameter (r=903).

Table 1: Regression line equation of the relationship between the measurement of the fetal parameters and gestational age in Shami goats

Parameters	Regression line equation	R^2	P-value
Crown-rump length	Y=0.5055x+24.642	0.841	<0.001
Head diameter	Y=1.6301x+33.967	0.842	<0.001
Chest diameter	Y=1.4470x+37.565	0.880	<0.001
Trunk diameter	Y=1.3750x+31.876	0.813	<0.001

Discussion

According to the available references, this study is the first in Iraq to estimate the gestation age in Shami goats using transabdominal ultrasonography. The last study in Shami goats detected the relation between the fetal number and the placentomes size (14). Also, there was another study in Syria using a linear array transducer to detect early pregnancy in Shami goats (17).

This study illustrates that ultrasonography is an essential tool for early pregnancy diagnosis in goats, and it agrees with that reported in goats by (18). The accuracy of ultrasound was 100% when detecting pregnant and non-pregnant cases; this is also in agreement with (19), who found accuracy levels of 100%.

The study showed that the embryos were detected at day 25 of gestation. These results are similar to those obtained by Medan *et al.* (19), who observed that the embryo in Shiba goats first at 24.3 days of gestation. Also, these results agreed with the results of Khand *et al.* (20), who reported the first sign of pregnancy in Teddy goats on day 19 of gestation and proper embryo with echoic structure within uterine fluid on day 21. Results of the present study confirm the finding of Sayuti *et al.* (11), who observed the embryo of Kacang goats firstly at 24 days of pregnancy, and observation of Devi *et al.* (21), who measured the embryo of Assam hill goats first time on 24 days of pregnancy.

The measurements of the crown-rump length of the fetus have been used successfully to estimate gestational age in different species. The current study measured crown-rump length first on 41-45 days of gestation. The same observation was recorded in Egyptian Baladi goats on 40-49 days of gestation (22). In comparison, the crown-rump length in other species of goats was measured at a less period of gestation; on 21 days in Teddy goats (20) and in local Bulgarian goats (23), on 25 days in Assam hill goats (21), on 30 days in Abaza and Gurcu goats (10), on 35 days in Iraqi back goats (13) and Kacang goats (11).

The crown-rump length of Shami goats recorded in the current study was ranged between 24.68 and 71.71 mm on 41-60 days of gestation. Similar values of the crown-rump length were recorded at the same period of pregnancy in Abaza goats (30-65 mm), Gurcu goats (33-72 mm) (10), Egyptian Baladi goats (35.9-71.6 mm) (22), and Iraqi back goats (29-64 mm) (13). The value of the crown-rump length recorded in this study is considered smaller than those measurements observed at the same period of pregnancy in local Bulgarian goats (23), Assam hill goats (21), and Kacang goat (11).

A highly significant correlation ($R^2 = 0.91$) was recorded in our study between the measurements of the crown-rump length and gestational age of Shami goats. Similar levels of the correlation coefficient were observed between the crown-rump length and gestational age of other spices of goats; local Bulgarian goats (R^2=0.92) (9), Abaza goats ($R^2 = 0.929$) (10), Saanen goat (R^2=0.90) (7). A relatively higher correlation ($R^2 = 0.94$) was found between the crown-rump length and gestational age in Anglo-Nubian goats (24), in Gurcu goats (10), and Egyptian native goats (6). In comparison to the results of the present study, higher values of the correlation coefficient ($R^2 \geq 0.98$) between the crown-rump length and gestational age were reported in Iraqi back goats (13), Teddy goats (20), and Shiba goats (25).

The fetal head diameter was measured successfully from 51 days until 120 days of gestation in Shami goats. The value of this parameter ranged between 15.63 and 45.04 mm. Closer results were obtained in Iraqi black goats (40-100 days of gestation; the fetal head diameter was 10.8-44.8 mm) (13). While the value of fetal head diameter in our study was higher than the values recorded in Egyptian Baladi goats at the same pregnancy period (11.9-36.2 mm, 40-109 days) (22).

Other studies were measured the fetal head diameter at a pregnancy period earlier than that presented in the current study. Therefore, the measurement of fetal head diameter was less than those were recorded in our results; in local Bulgarian goats (42-49 day; 9.4-13.8 mm) (23), in Assam hill goat (40-80 day; 9.5-25.49 mm) (21), in Abaza and Gurcu goats (30-90 day; 6-36 mm) (10). Conversely, Sayuti *et al.* (11) was recorded a value of fetal head diameter in Kacang goats similar to that recorded in our study but at an earlier period of gestation (17.4-21.8 mm on 35-45 days).

The present study showed a significant correlation (R^2=0.84) between the fetal head diameter and the gestational age of Shami goats. This level of correlation considers low in comparison to those were obtained in local Bulgarian goats (R^2=0.956) (9), in Saanen goats (R^2=0.956) (7) in Abaza and Gurcu goats (R^2= 0.925 and 0.928) (10), and Iraqi back goats ($R^2 = 0.95$) (13). Conversely, our study's correlation level was higher than that recorded in Korean

black goats between 60 and 135 days of gestation ($R^2 = 0.65$) (5).

The chest diameter was easily observed and measured using transabdominal ultrasonography. This parameter was obtained in the present study between days 51 and 110 of pregnancy (11.52 - 56.35 mm). A significant positive correlation ($R^2 = 0.88$) was recorded in the present study between the chest diameter measurements and the gestational age of Shami goats. According to our knowledge, only two studies have measured the chest diameter in goats and its association with the pregnancy age. The first study recorded a similar level of the correlation coefficient ($R^2 = 0.869$) between the measurement of chest diameter and gestational age of Shiba goats (25). At the same time, the value of the correlation coefficient calculated in the current study was lower than that recorded in Saanen goats ($R^2 = 0.98$) (26).

In the present study, trunk diameter was measured on 41-50 days of gestation for the first time. The same observation was recorded in Egyptian native goats on 40 days of gestation (6) and Shiba goats on day 42 of pregnancy (25). In contrast, the trunk diameter in other species of goats was measured at an earlier period of gestation; on 21 days in Teddy goats (20), on 28 days in local Bulgarian goats (23), on 30 days in Abaza and Gurcu goats (10).

The fetal trunk diameter of Shami goats recorded in the current study was ranged between 10.96 and 57.38 mm on 41-130 days of gestation. Similar values of trunk diameter were recorded on 45-90 days of gestation in Abaza and Gurcu goats (16-45 mm) (10). The value of trunk diameter recorded in this study is considered smaller than those measurements observed at the same period of pregnancy in Teddy goats (20), Local Bulgarian goats (23), and Korean black goats (5).

A significant correlation ($R^2 = 0.812$) was recorded in our study between the measurements of trunk diameter and the gestational age of Shami goats. Closer values of the correlation coefficient ($R^2 = 0.89$) were found between the trunk diameter and gestational age in Shiba goats (25) and Korean black goats (5). In comparison to the results of the present study, higher values of the correlation coefficient ($R^2 \geq 0.92$) between the fetal trunk diameter and gestational age were reported in Egyptian native goats (6), Teddy goats (20), Abaza and Gurcu goats (10).

According to the above information, we find significant differences between the measurements of fetal parameters recorded in the current study for Shami goats compared to those presented in other studies of other goat breeds. These differences may be mainly due to different goat breeds, especially the difference in body size, which reflects and influences the measurements of fetal parameters.

The other reason for the above differences may be the ultrasonography approach. The transabdominal ultrasonography approach depended on the current study for pregnancy diagnosis, pregnancy observation, and obtaining

the measurements of fetal parameters. This approach was considered safe and not harmful for animals during the examination. On the contrary, the transrectal approach of ultrasonography gives more accurate results and at an earlier period of pregnancy.

Conclusions

In conclusion, transabdominal ultrasonography is a practical method for pregnancy diagnosis in goats and embryo monitoring. However, it is reliable to estimate gestation age starting on 41 days of pregnancy. The chest diameter was the best fetal parameter, but trunk diameter can be used for the most extended period to estimate the gestational age of Shami goats.

Acknowledgments

Conflict of interest

There are no conflicts regarding the publication of this manuscript.

References

1. Mavrogenis A, Antoniades N, Hooper R. The Damascus (Shami) goat of Cyprus. Anim Gen Res Inf. 2006;38:57-65. DOI: 10.1017/S1014233900002054
2. Noakes DE, Parkinson TJ, England GC. Arthur's veterinary reproduction and obstetrics. 8th ed. USA: Saunders; 2001. 54-202.
3. Oliveira CRGS, Melo CHS, Souza-Fabjan JMG, Filho ACAT, Batista RITP, Pereira AF, Melo LM, Freitas VJF, Teixeira DÍA. Ultrasonographic evaluation of hG-CSF transgenic goat conceptus. R Bras Ci Vet. 2014;21(1):53-59. DOI: 10.4322/rbcv.2014.018
4. Anya KO, Ekere SO, Ogwu DO. Early pregnancy diagnosis using trans-abdominal ultrasonography in West African dwarf goats. Nig Vet J. 2017;38(4):311-318. DOI: 10.4314/nvj.v38i4.6
5. Lee Y, Lee O, Cho J, Shin H, Choi Y, Shim Y, Choi W, Shin H, Lee D, Lee G, Shin S. Ultrasonic measurement of fetal parameters for estimation of gestational age in Korean black goats. J Vet Med Sci. 2005;67(5):497-502. DOI: 10.1292/jvms.67.497
6. Karen AM, Fattouh ESM, Abu-Zeid SS. Estimation of gestational age in Egyptian native goats by ultrasonographic fetometry. Anim Reprod Sci. 2009;114(1-3):167-174. DOI: 10.1016/j.anireprosci.2008.08.016
7. Abdelghafar RM, Ahmed BH, Ibrahim MT, Mantis P. Prediction of gestational age by transabdominal real-time ultrasonographic measurements in Saanen goats (*Capra hircus*). Global Vet. 2011;6(4):346-351. [available at]
8. Waziri MA, Ikpe AB, Bukar MM, Ribadu AY. Determination of gestational age through trans-abdominal scan of placentome diameter in Nigerian breed of sheep and goats. Sokoto J Vet Sci. 2017;15(2):49-53. DOI: 10.4314/sokjvs.v15i2.7
9. Karadaev M, Fasulkov I, Yotov S, Atanasova S, Vasilev N. Determination of the gestational age through ultrasound measurements of some uterine and foetal parameters in Bulgarian local goats. Reprod Domest Anim. 2018;53(6):1456-1465. DOI: 10.1111/rda.13305

10. Kuru M, Oral H, Kulaksiz R. Determination of gestational age by measuring defined embryonic and foetal indices with ultrasonography in Abaza and Gurcu goats. Acta Vet Bron. 2018;87:357-362. DOI: 10.2754/avb201887040357

11. Sayuti A, Khairiah K, Siregar T, Melia J, Syafruddin S, Rahmi E, Herrialfian H, Abrar M, Panjaitan B, Daud R. Determination of gestational age and observation of Kacang goat fetal development during 60 days of pregnancy by using transcutaneous ultrasonography. J Vet. 2019;20(4):534-540. DOI: 10.19087/jveteriner.2019.20.4.534

12. Rasheed YM. Ultrasonic estimation of gestation age in goats via placentomes diameter. Iraqi J Vet Med. 2016;40(2):100-106. DOI: 10.30539/iraqijvm.v40i2.120

13. Rasheed YM. Assessment of gestational age in goats by Real-Time Ultrasound measuring the fetal crown-rump length, and bi-parietal diameter. Iraqi J Vet Med. 2017;41(2):106-112. DOI: 10.30539/iraqijvm.v41i2.58

14. Hussein K. Detection of single and multiple pregnancy depending on placentomes measurement in Shami goats in Iraq by Ultrasonography. Iraqi J Vet Med. 2017;41(2):118-123. DOI: 10.30539/iraqijvm.v41i2.60

15. Kähn W. Veterinary reproductive ultrasonography. Schlutersche Verlagsgesellschaft mbH and Co; 2004. 143-168 p.

16. Lazim EH, Alrawi HM, Aziz DM. Relationship between gestational age and transabdominal ultrasonographic measurements of fetus and uterus during the 2nd and 3rd trimester of gestation in cows. Asian Pacific J Reprod. 2016;5(4):326-330. DOI: 10.1016/j.apjr.2016.06.010

17. Roukbi M. The use of ultrasonography for early detection of pregnancy and measurement of some foetal pattern in Damascus goats. Iraqi J Vet Sci. 2013;27(1):35-44. DOI: 10.33899/ijvs.2013.82857

18. Kähn W, Fraunholz J, Kaspar B, Pyczak T. Sonographic diagnosis of early pregnancy in horses, cattle, sheep, goats, swine, dogs and cats. Standard values and limitations. Berl Münch Tierärzt Wochenschr. 1990;103(6):206-211. [available at]

19. Medan M, Watanabe G, Absy G, Sasaki K, Sharawy S, Taya K. Early pregnancy diagnosis by means of ultrasonography as a method of improving reproductive efficiency in goats. J Reprod Develop. 2004;50(4):391-397. DOI: 10.1262/jrd.50.391

20. Khand FM, Kachiwal AB, Laghari ZA, Lakho SA, Khattri P, Soomro SA, Korejo NA, Leghari A. Early pregnancy diagnosis and fetometry by real-time ultrasonography in Teddy goat. Pakistan J Zool. 2021;53(3):853-858. DOI: 10.17582/journal.pjz/20190315060355

21. Devi NB, Bhuyan D, Das A, Kalita D, Ozukum S. Detection of pregnancy with the determination of foetal indices in Assam hill goat. Pharma Innovation J. 2019;8(7):221-225. [available at]

22. Amer HA. Determination of first pregnancy and foetal measurements in Egyptian Baladi goats (*Capra hircus*). Vet Italiana. 2008;44(2):429-437. [available at]

23. Karadaev M, Fasulkov I, Vassilev N, Petrova Y, Tumbev A, Petelov Y. Ultrasound monitoring of the first trimester of pregnancy in local goats through visualisation and measurements of some biometric parameters. Bulg J Vet Med. 2016;19(3):209-217. DOI: 10.15547/bjvm.909

24. Martinez MF, Bosch P, Bosch RA. Determination of early pregnancy and embryonic growth in goats by transrectal ultrasound scanning. Theriogenology. 1998;49(8):1555-1565. DOI: 10.1016/S0093-691X(98)00101-0

25. Kandiel MMM, Watanabe G, Taya K. Ultrasonographic assessment of fetal growth in miniature "Shiba" goats (*Capra hircus*). Animal Reprod Sci. 2015;162:1-10. DOI: 10.1016/j.anireprosci.2015.08.007

26. Yazici E, Ozenc E, Celik HA, Ucar M. Ultrasonographic foetometry and maternal serum progesterone concentrations during pregnancy in Turkish Saanen goats. Animal Reprod Sci. 2018;197:93-105. DOI: 10.1016/j.anireprosci.2018.08.017

تقدير عمر الحمل في الماعز الشامي بالاعتماد على قياسات الامواج فوق الصوتية عبر جدار البطن لمعايير الجنين

روژ سلام محمد و ظافر محمد عزيز

فرع الجراحة وعلم تناسل الحيوان، كلية الطب البيطري، جامعة الموصل، الموصل، العراق

الخلاصة

هدفت الدراسة الحالية الى تقدير عمر الحمل في الماعز الشامي من خلال قياس معايير الجنين باستخدام الفحص بالامواج فوق الصوتية عبر جدار البطن. تم استخدام ٣٣ من اناث الماعز الشامي عمرها بين ٢-٢٫٥ سنة ولها تاريخ معروف لبدء الحمل. فحصت الحيوانات في وضع الوقوف باستخدام المجس المحدب ذو التردد ٣٫٥ ميكاهرتز لجهز التصوير بالامواج فوق الصوتية. فحصت اناث الماعز أسبوعيا ابتداء من اليوم ٢١ من الحمل حتى الولاة. أخذت قياسات معايير الجنين التي شملت الطول التاجي للجنين، وقطر الرأس، وقطر الصدر، وقطر الجذع من صور الامواج فوق الصوتية باستخدام برنامج Screen Calipers. أظهرت النتائج ملاحظة الكيس الجنيني والاجنة ابتداءً من اليوم ٢١ و ٣٥ من الحمل، على التوالي. تراوح عدد الاجنة للاناث الحوامل بين ٢-٣ أجنة. الطول التاجي للجنين تراوح بين ٢٤٫٦٨ ± ١٫٣٢ - ١٫٨٤±٧١٫٧١ ملم بعمر ٤١-٦٠ يوم، وقطر الرأس ١٥٫٦٣±٠٫٨٢ - ٠٫٩٢±٤٥٫٠٤ ملم بعمر ٤١-١٢٠ يوم، وقطر الصدر ١١٫٥٢±٠٫٨٤ - ٠٫٩٣±٥٦٫٣٥ بعمر ٥١-١١٠ يوم، وقطر الجذع ١٠٫٦٩±٠٫٨٥ - ٠٫٨٥±٥٧٫٣٨ ملم بعمر ٥١-١١٠. لوحظ وجود أعلى ارتباط إيجابي بين قطر الصدر وعمر الحمل (r=0.935)، والطول التاجي للجنين (r=0.917)، وقطر الرأس (r=0.917)، وقطر الجذع (r=0.903). استنتج من الدراسة ان الفحص بالأمواج فوق الصوتية عبر جدار البطن طريقة عملية لتشخيص الحمل ومراقبة الجنين في الماعز الشامي. أيضا هي طريقة عملية لتقدير عمر الحمل بدءاً من اليوم ٤١ من الحمل. لقد كان قطر الصدر أفضل معايير الجنين، ولكن قياس قطر الجذع يمكن استخدامه لمدة أطول في تقدير عمر الحمل لإناث الماعز الشامي.