Research Article

AL- ANBAR JOURNAL OF VETERINARY SCIENCES

Vol. 14 Issue:2, (2021) ISSN: P-1999:6527 E-2707:0603

Effect of Some Months on Follicles and Oocytes Recovered from Iraqi Ewes

A.A. Munther[1*], T.R. Mohammed[1] and A.F. Majeed[2]

[1]Animal Production, College of Agriculture, University of Anbar and [2]College of Veterinary Medicine, University of Fallujah

* Corresponding Autho, E-mail alaamonther94@yahoo.com

Doi: https://doi.org/10.37940/AJVS.2021.14.2.9

Received: 19/6/2021 Revised:28/10/2021 Accepted:13/11/2021

Abstract

The aim of the current study was to know the effect of season on the numbers of follicles and Oocytes recovered during Several months. 304 genital systems of Ewes were collected from Al-Fallujah abattoir/ Al-Fallujah, Al-Anbar province, during the period from 3, January 2021 to 1, July 2021. The samples were transported with Cool Box contained normal saline to the Reproductive Biotechnology Lab/Dept. of Surgery and Obstetrics / College of Vet. Medicine, University of Fallujah. The results showed that the total numbers of Oocytes with Cumulus cells recovered were 1037 oocytes. The results also showed a significant difference ($P \leq 0.01$) in the numbers of follicles between the right and the left ovaries. The numbers of follicles present at right ovaries were 776 in a percentage of (56.73%) from the total numbers where it was 592 follicles at the left ovaries in a percent of (43.27%) from the total numbers. It has been observed superiority of right ovary on the left ovary in the numbers of oocytes recovered, where it was 603 oocytes (58.15 %) from the right ovary and 434 oocytes (41.85 %) from the Left ovary. Also, the results showed a high Significant difference ($P \leq 0.01$) in the size of large and small follicles numbers. when the small follicles have large numbers. It has been also concluded from this study that there was a significant difference ($P \leq 0.01$) in the numbers of follicles and oocytes between the months of March and April as compared with other months.

Keywards: Breeding Season, Oocytes, Iraqi Ewes follicles.

تأثير بعض الشهور في عدد الجريبات والبويضات المستحصل عليها من نعاج الأغنام العراقية

الخلاصة

هدفت الدراسة الحالية لمعرفة تأثير الموسم على عدد الجريبات والبويضات الناتجة منها خلال عدة أشهر مختلفة. تم جمع 304 جهاز تناسلي أنثوي من مجزرة قضاء الفلوجة/محافظة الأنبار كمصدر للحصول على مبايض النعاج لغرض إجراء التجارب الخاصة بالبحث، خلال الفترة من 1 كانون الثاني 2021 الى 1 تموز 2021، إذ أجري البحث في مختبر تقانة التكاثر فرع الجراحة والتوليد في كلية الطب البيطري – جامعة الفلوجة. أظهرت نتائج الدراسة أن إجمالي عدد البويضات المستحصل عليها هي 1037 محاطة بخلايا ركامية. أيضاً بينت النتائج وجود تفوق معنوي ($P \leq 0.01$) في عدد الجريبات إذ كان المبيض الأيمن 776 بنسبة (56.73 %) من المجموع الكلي. بينما كان العدد للمبيض الأيسر 592 بنسبة (43.27 %) من المجموع الكلي، حيث لوحظت فروق معنوية ($P \leq 0.01$) لعدد الجريبات المستحصلة في موقع المبيض بين المبيض الأيمن والأيسر، كذلك لوحظ تفوق المبيض الأيمن على الأيسر في عدد البويضات المستحصلة من الجريبات إذ كانت 603 بويضة بنسبة (58.15 %) من المبيض الأيمن و 434 بويضة بنسبة (41.85 %) من المبيض الأيسر، كما تبين من نتائج الدراسة وجود تفوق على مستوى معنوية ($P \leq 0.01$) في حجم الجريبات بين الصغيرة والكبيرة حيث تفوقت الجريبات الصغيرة، وأيضاً لوحظ من نتائج الدراسة وجود تفوق عالي المعنوية ($P \leq 0.01$) في الشهر الثالث والرابع مقارنة بباقي أشهر الدراسة.

Introduction

Seasonality were an important factor that affect the animal production so that the a availability of products for this sector was seasonal not all over the year, and as a result it will not satisfy the growing need . Sheep were seasonal polyestrous animals, and their reproductive activity with Lambs birth guarantee at the perfect date of the year, when plenty of pasture or food and also the moderate temperature at spring months (1). The oestrus cycles normally begins at the end of the summer and ends at the end of the winter or at early spring. There were a differences between different breeds in the time and length of breeding season (2 ; 3). There were several authors induce reproductive activity out of breeding season with the use of assisted technology such as oestrus Synchronization (4), Hormones (5) and in vitro fertilization (IVF) (6) . These technologies aimed to increase the numbers of births of high genetic merits and decrease the generation interval to accelerate genetic improvement (7). IVF is a biotechnology that plays an important role in acceleration of genetic improvement (8) and also availability of large scale production with low cost to a huge numbers of oocytes that assisted for maturation, fertilization and growth which is useful for sexing and Cloning (9), so this study were aimed to investigate the effect of season on the numbers of follicles and oocytes recovered during different months.

Materials and Methods

The study was conducted on 304 genital system of ewes, Collected from Al-Fallujah slaughter house, Al-Fallujah , Al-Anbar province, during the period from 3 January, 2021 to 3 July, 2021. The samples were transported with Cool Box Contained normal saline to the reproductive biotechnology Lab./Dept. of Surgery and Obstetrics/College of Vet. Medicine, University of Fallujah , within one hour. The ovaries were cut and freed from other tissues with a sterile scissor and pult it in a sterile peaker . The diameter of follicles were measured with electronic Vernier . Oocytes were recovered by aspiration method in a sterile Cabenate (sterilized with U.V. light) using 5ml Suring with gauge 18 needle Containing 3ml from MEM and DMFM Culture media. Aspirated oocytes were transported to a petredish Contained 16 wells in the Cabenate. The petredish were examined under Inverted Microscope for evaluation of oocytes and Graded . The oocytes were graded according to Wani (10) as a Good (A), Fair (B) and poor (C) according to the presence of Cumulus cells and uniform cytoplasm.

Maturation of Oocytes in vitro:

Only grade A and B oocytes were washed with MEM and DMEM culture media and in Cubated in a petredish of 16 wells in an incubator with 38.5 C^o, 5% Co_2 and relative humidity of 90 % for 24 hours. Examination of the petredish under inverted microscope has been done. The presence of first polar body indicate the maturation of the oocytes. The numbers of mature

oocytes calculated.

Statistical Analysis:

SAS-Statistical analysis system (11) were used analyzed of Data. Duncan multiple range test were used to compare the significant difference means (12).

Results and Discussion

Table-1 showed the effect of type of the ovaries on the numbers of follicles and Oocytes recovered from them. The numbers of follicles present in 608 ovaries are 1368 with a mean of 2.25 per ovary. It has been observed that the right ovary having more follicles 776 in a percent of 56.73% as compared with the left one 592 in a percent of 43.27% from the total numbers of follicles. There was a significant difference (P≤0.01) in the numbers of follicles present in the right and left ovaries. The results also showed the superiority (Table-1) of Right ovary than the left one in the numbers of Oocytes recovered . The numbers of oocytes recovered from right ovary was 603 in a percent of 58.15 % where it was from the left ovary 434 in a percent of 41.85% .

These results were agreed with (13), when the result showed that the left ovary having less activity the right ovary in the numbers of follicles and the numbers of recovered oocytes with a significant difference of (P<0.05). These result not agreed with (6) who observed that the left ovary more active (59.4%) than the left one (40.6 %) with a significant difference (P≤0.05) in the numbers of follicles and recovered oocytes.

Table (1) Effect of type of the ovaries on the numbers of follicles and Oocytes recovered from them.

Type of Ovary	Sample Nu.	Follicles Nu.(%)	Oocyte Nu. (%)
Right	304	(56.73) 776	603 (58.15)
Left	304	592 (43.27)	434 (41.85)
Total	**608**	**1368**	**1037**
Kay square value (x^2)	---	** 24.748	**27.541 **
.(P≤0.01) **			

Table-2 showed the effect of follicular size on the recovery rate . The numbers of Large follicles observed (5-8 mm) was 573 (41.88 %) with mean size of 5.44 ± 0.08 mm , while the numbers of small follicles (2-4 mm) was 795 (58.12 %) with a mean of 3.28 ± 0.03 mm. The results showed that there was a significant difference (P≤0.01) in follicular size between small and large follicles when the small follicles showed superiority. This might be due to the one follicles or more in a normal condition reach to the growth and become dominant which responsible for secretion of estrogen hormone in contrast to the numbers of small follicles (14). These results were agreed with several authors (6; 15; 16). It has been reported that the follicular size affected by different factors such as: the reproductive status of the animals, breeding season, Age, Hormonal stimulus and the nutritional status of the animals.

Table (2) Effect of follicular size on the recovery rate.

Follicles	Number	Percentage (%)	Mean ± SE
-5(Large 8mm)	573	(%41.88)	**5.44 ± 0.08**
Small (2-4mm)	795	(%58.12)	**3.28 ± 0.03**
Total	1368	% 100	---
Significant	---	**	**
.(P≤0.01) **			

Table -3 showed the effect of seasonality on distribution of Oocytes recovered during the period of study. The results showed a high significant difference (P≤0.01) in the 3rd and 4th months as compared with other months of study in the recovery rate. The numbers of oocytes recovered at 3rd month was 254 (24.49 %) while it was 295 (28.44%). This might be due to these months was the beginning of sheep active season, that leads to ovarian activity with growing and developed follicles. This results agreed with several authors (2; 17; 18). The patterns of seasonality in reproduction were proportionate to permit occurrence of pregnancy at spring months, where the limitation of reproductive activity of sheep in given time of the year, could be useful to get the lambing at proper time, which maintained well growth and development of lambs. Also there were elimination Control seasonality in the sheep which include multi environmental signals such as photo period and locality (19).

Table (3) The effect of seasonality on the distribution of Oocyte obtained during the study period.

Months	Number of Genital System	Number of Oocyte	(%)Percentage
January	25	82	8.00
February	33	101	9.74
March	74	254	24.49
April	77	295	28.44
May	53	168	.1622
Jun	42	136	13.11
Total	**304**	**1037**	100%
Chi-square value (x^2)			8.391 **
**P≤0.01			

Conclusion

It was concluded from this study that there was a significant difference in the numbers of follicles and Oocytes recovered in the 3rd and 4th months as compared with other months.

References

1. Gomez-Brunet, A., Santiago-Moreno, J., Toledano-Diaz, A., and Lopez-Sebastian, A.. Reproductive seasonality and its control in Spanish sheep and goats. Tropical and Subtropical Agroecosystems; 2012. 15(1).
2. Senger, P. L. Pathways to pregnancy and parturition. Current Conceptions. Inc. Pullman, WA; 2003. 144.
3. Maquivar, M. G., Smith, S. M., and Busboom, J. R. Reproductive Management of Rams and Ram Lambs during the Pre-Breeding Season in US Sheep Farms. Animals; 2021. 11(9), 2503.
4. Mohammed, T., Al-Ani, A., and Munther, A. Effect of arginine on physiological and

reproductive performance of Awassi ewes. Iraqi J. of Vet. Sci; 2019. 33(2), 213-220.

5. Padeanu, I., voia, S., gavojdian, D.mfratila, i., mircu, c.,bratu,i., pascal, c. and sauer,i. Effect of using Melatonin Implants on reproductive performances in turcana ewes. Anim. Sci; 2011. 44(2), 23-34.
6. Omar, A. A., Ahmed, M. N., Asker, A. S., Majeed, A. F., Faraj, T. M., and Rejah, S. J. In Vitro Production of Ovine Embryo in Non-Breeding Season. Indian Journal of Forensic Medicine and Toxicology, 2021. 15(1), 2047.
7. Wright, V. C., Schieve, L. A., Reynolds, M. A., and Jeng, G. Assisted reproductive technology surveillance—United States, 2002. Morbidity and Mortality Weekly Report: Surveillance Summaries; 2005. 54(2), 1-24.
8. Gordon, I. Laboratory production of cattle embryos; 2003. (Vol. 27), CABI.
9. Abd Al-Hafedh, S. O., Mohammed, T. R., and Al-Timimi, I. H. Effect of recovery methods of bovine oocytes on in vitro maturation. Al-Anbar J. of Vet. Sci., 2017. 10(1).
10. Wani, N. A., Wani, G. M., Khan, M. Z., and Salahudin, S. Effect of oocyte harvesting techniques on in vitro maturation and in vitro fertilization in sheep. Small Rum. Res; 2000. 36(1), 63-67.
11. SAS. Statistical Analysis System, User's Guide. Statistical. Version 9.1th ed. SAS. Inst. Inc. Cary. N.C. USA. 2012.
12. Duncan, D.B. Multiple Rang and Multiple F-test. Biometrics; 1955. 11: 4-42.
13. Majeed A.F., Omar A.A., Alrawi Saad Thabit Jassim, Al-Maadhidy Assif H., Ahmed K.D. and Khudair Mohamed . Effect of collection methods on oocyte recovery rate in sheep. Research J. of Biotechnology; 2019a Mar. Vol. 14 (Special Issue I).
14. Garg, D., and Berga, S. L. Neuroendocrine mechanisms of reproduction. In Handbook of Clinical Neurology; 2020. (Vol. 171, pp. 3-23). Elsevier.
15. Kharche, S. D., Goel, P., Kumar Jha, B., Goel, A. K., and Jindal, S. K. Factors influencing in-vitro embryo production efficiency of caprine oocytes: A review. Indian Journal of Animal Sciences; 2011. 81(4), 344.
16. Majeed, A. F., Al-Timimi, I. H., and Al Saigh, M. N. In vitro embryo production from oocyte recovered from live and dead Iraqi black goat: A preliminary study. Research Journal of Biotechnology; 2019b. 14, 226-233.
17. Rosa, H. J. D., and Bryant, M. J. Seasonality of reproduction in sheep. Small Rumin. Research; 2003. 48(3), 155-171.
18. Brunet, A. G., Santiago-Moreno, J., Toledano-Diaz, A., and Lapez-Sebastia, A. Reproductive seasonality and its control in Spanish sheep and goats. Tropical and Subtropical Agroecosystems; 2011. 15(S1).
19. Bronson, F. H. Climate change and seasonal reproduction in mammals. Philosophical Transactions of the Royal Society B: Biological Sci.; 2009. 364(1534), 3331-3340.