

SOME FACTORS AFFECTING OVARIAN MEASUREMENTS IN SHE-CAMELS (*CAMELUS DROMEDARIUS*).

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ABSTRACT: One hundred and ninety nine ovaries were collected from 102 Dromedary camels at random from El-Bassatein and El-Warraq slaughterhouses of Cairo, Giza. Left and right ovaries were collected separately per donor and placed in punctured plastic bag immediately after slaughtering into thermos in saline solution (0.9% NaCl) supplemented with antibiotics at 28-30°C. Ovarian measurements included weight, volume, length and width were recorded in this study showed. The obtained results showed that the overall mean of ovarian weight, volume, length and width were (5.6 g, 5.1 cm³, 3.5 cm and 2.7 cm), respectively. The ovarian site affected ($P<0.01$) all studied ovarian measurements. However, reproductive status and season affected ($P<0.01$) only ovarian weight and volume. The highest ovarian weight, volume and length (10.3 g, 9.8 cm and 4.8 cm) were obtained from the left ovaries bearing CL during non-breeding season. However, the highest ovarian width was recorded for the ovaries of the left side bearing CL during breeding season (3.2 cm). Ovarian weight, volume and length were affected ($P<0.01$) by the interaction of season x ovarian site x reproductive status, while the ovarian width wasn't affected.

Key word: Camel, ovary, weight, volume, season, ovarian site.

INTRODUCTION

Various measurements of the ovary indicate to its physiological activity. The ovarian weight, volume and its structure are the most important features to be taken into account when ovaries were used as a source of oocytes for *in-vitro* maturation (IVM) and *in-vitro* fertilization (IVF) in the lab (Sarhan 2007; Amer and Moose 2008; Zeidan *et al.* 2008). Also, reproductive status, is very important to know the extent of ovarian activity and its ability to give high-quality oocytes dromedary camel is considered as a seasonally polyestrous animal with a relatively short breeding season (Zeidan *et al.*, 2011). Outside the breeding season, the mating activity ceases and the ovaries are inactive or show a limited number of small follicles (Shalash, 1980; Khatir *et al.* 2007). In addition, the ovarian activity in she-camels was found to be mainly follicular rather than luteal (Musa and Abusineina, 1978). This study aimed to investigate the effect of site of the ovary (right or left), season of the year (breeding

and non-breeding) and presence of CL on some ovarian measurements in she camel.

MATERIALS AND METHODS

The experimental work of this study was carried out in the IVF and embryo transfer (ET) Laboratory, Department of Animal Production, Faculty of Agriculture, Menoufiya University, Egypt, during the period from October 2011 to August 2013.

Ovaries Collection:

One hundred and ninety nine ovaries were collected from 102 Dromedary camels from El-Bassatein and El-Warraq slaughterhouses, Cairo and Giza Province, located at distance approximately 125 km. A from the laboratory. The previous reproductive history of the slaughtered animals was unknown. In this concern, left and right ovaries were collected separately per donor and placed in punctured plastic bag immediately after slaughtering into thermos in saline solution (0.9% NaCl) supplemented with antibiotics (100 IU

penicillin and 100 µg streptomycin/ml) at 28-30°C. collected ovaries were transported to the laboratory within 2-3 h.

Ovarian Measurements Assessment:

In the laboratory, the excess tissues were cut from the ovarian stalk of each ovary (right or left) per donor. Ovaries were washed two times with warmed 30°C phosphate buffer saline (PBS) supplemented with antibiotics (100 IU penicillin and 100 µg streptomycin/ml) to remove adhering clotted blood. Then all ovaries were quickly washed with ethanol (70%) to remove any contamination on the surface of the ovaries.

Ovarian weight was determined by electronic balance to the nearest milligram. Ovarian length & width were measured using a plastic tape. Ovarian volume estimated by water displacement technique to the nearest cubic centimeter. At the same time, the ovaries were examined for the presence of CL and recorded.

Statistical Analysis:

Statistical analysis for the obtained data were analyzed using SPSS program (2012), while differences among the treatment mean were performed using Duncan Range Test (Duncan, 1955). The percentages values were adjusted to arcsine transformed before performing the analysis of variance. Means were presented after being recalculated from transformed values to percentages.

RESULTS AND DISCUSSION:

Ovarian Weight:

Data listed in Table 1 revealed that the overall mean of the ovarian weight of 199 ovaries examined in the present study was 5.6 g. It was affected significantly ($P < 0.01$) by season, reproductive status and ovarian site (Table 1). In this respect, average ovarian weight obtained from camels during non-breeding season (6.2 g), from ovaries bearing CL (6.9 g), from the left ovaries (6.9 g) was significantly ($P < 0.01$) higher as compared to that those obtained during breeding season (5.3 g), from the ovaries

without CL (5.0 g), from the right ovaries (4.6 g).

In agreement with the presented results, Khalil *et al.* (2005) demonstrated that camel ovarian weight was significantly ($P < 0.05$) affected by the reproductive status, being heavier by 73% for ovaries bearing CL than those not bearing CL.

Results in Table 1 further indicates that season of the year interacted significantly ($P < 0.05$) with site of the ovary and insignificantly with the reproductive status, meanwhile the interaction of reproductive status x ovarian site x season was highly significant ($P < 0.01$). Zeidan *et al.* (2011) showed that the effect of season of the year was significant ($P < 0.05$) on ovarian weight, being the heaviest ($P < 0.05$) during autumn and winter and the lowest ($P < 0.05$) values were recorded during summer and spring seasons. Similar trends were illustrated by Abdoon and Omaima (2006) and Sarhan (2007). At the same time, Ali *et al.* (2007) reported that the ovarian weight of camel was significantly affected by the seasons, being higher during the breeding season than that during the non-breeding season for both ovaries (R and L).

On the other hand, Zeidan *et al.* (2011) found that ovarian weight was significantly ($P < 0.05$) higher on the left site than that recorded on the right ones during all seasons of the year. However, Amer and Moose (2008) found that the weight of the left ovary in camels was insignificantly higher than that of the right one during spring, summer and autumn seasons. These results are in agreement with those reported Khalil *et al.* (2005), who found that the weight of the right and left camel ovaries did not differ significantly, showing nearly similar values on both sites (5.68 and 5.25 g for the right and left sites, respectively). On the other hand, Yahaya *et al.* (1999) showed that the right ovary was heavier ($P < 0.01$) and had more follicular fluid ($P < 0.01$) than left ovaries. In this way, Djang *et al.* (1988) and El-Wishy (1992) reported that ovarian weight increases with ovarian activity.

Some factors affecting ovarian measurements in she-camels

Table (1): Effect of interaction among season, reproductive status and ovarian site on ovarian weight (g) and volume (cm³) in she-camel.

Season	Repro. status	Ovarian site	No. of ovaries	Ovarian Weight (gm)	Ovarian volume (cm ³)
Breeding season	Ovaries with CL	R	24	5.4 ± 0.5	5.1 ± 0.5
		L	22	7.4 ± 0.5	6.5 ± 0.9
		Average	---	6.3 ± 0.4	5.8 ± 0.3
	Ovaries without CL	R	23	3.4 ± 0.5	3.3 ± 0.6
		L	25	5.2 ± 0.5	4.7 ± 0.6
		Average	---	4.3 ± 0.4	4.1 ± 0.3
Non-Breeding season	Ovaries with CL	R	17	4.8 ± 0.6	4.2 ± 0.6
		L	17	10.3 ± 0.6	9.8 ± 0.6
		Average	---	7.7 ± 0.4	7.0 ± 0.4
	Ovaries without CL	R	36	4.8 ± 0.4	4.3 ± 0.4
		L	35	6.1 ± 0.40	5.4 ± 0.4
		Average	---	5.5 ± 0.3	4.8 ± 0.3
Overall average			199	5.6 ± 0.3	5.1 ± 0.3

Overall mean of ovarian weight (gm):

With CL = 6.9

R= 4.6

during breeding season = 5.3

Without CL= 5.0 **

L= 6.9 **

during non-breeding season = 6.2**

Overall mean of ovarian volume (cm³):

With CL = 6.3

R = 4.2

during breeding season = 4.9

Without CL = 4.6**

L = 6.3**

during non-breeding season = 5.5**

Ovarian Volume:

Results obtained in Table 1 indicated that the overall mean of the ovarian volume in dromedary camels was 5.1 cm³, irrespective reproductive status, breeding season or ovarian site. Statistical analysis revealed that reproductive status, breeding season and ovarian location significantly (P<0.01) affected ovarian volume. Ovarian volume in she-camels was significantly (P<0.01) bigger during non-breeding season (5.5 cm³) than breeding season (4.9 cm³). This was associated with bigger ovaries bearing CL than those obtained from non-breeding season ovaries during breeding season or non-breeding seasons (Table 1). Ali *et al.* (2007) reported that the ovarian camel volume was significantly affected by the

seasons, being higher during the breeding season than the non-breeding season for both (R and L ovaries). The effect of interaction of season x site, reproductive status x site and season x reproductive status x site were significant (P<0.01), while the effect of interaction of season x reproductive status was not significant.

Ovarian length and width:

Results in Table (2) revealed that each of ovarian site and reproductive statuses proved significant effect on both length and width of the ovary. However, season of the year indicated insignificant effect on ovarian length and width. Overall mean of ovarian length and width obtained from the ovaries bearing CL (3.9 and 2.8 cm) or from the left

ovaries (3.9 and 2.9 cm) was significantly higher than that obtained from the ovaries without CL (3.5 and 2.6 cm, respectively) or from the right ovaries (3.3 and 2.5 cm, respectively). However, the differences in the length and the ovary between breeding and non-breeding seasons were not significant. Overall mean of ovarian length and width during breeding season (3.6 and 2.8 cm) and non- breeding season (3.6 and 2.7 cm, respectively). In this concern, Higgins (1986) observed that the length and width of she-camel ovaries were 4.0, and 2.5 cm, respectively. However, Tingari (1987) recorded these values as 3.1 and 2.2 cm. While, Zia-ur-Rahman (2004) reported that length and width of left ovary were 3 ± 0.59 and 0.8 ± 0.19 cm and for right ovary

were 2.87 ± 0.58 and 2.07 ± 0.36 cm for the right ovary. Tingari (1987) postulated that the corpora lutea originate from ruptured follicles which were usually found towards the poles of the ovary could be resulted in increasing length and perhaps width also, but not thickness of the ovary.

In conclusion, the ovarian measurements including weight, volume, length and width were affected significantly by season of the year, reproductive status and ovarian site. The highest ovarian weight, volume and length obtained from the left ovaries bearing CL during non-breeding season. However, the highest ovarian width was recorded for the ovaries of the left side bearing CL during breeding season.

Table (2): Effect of interaction among season, reproductive status and ovarian site on ovarian length and width (cm) in she-camel.

Season	Repro. status	Ovarian site	No. of ovaries	Ovarian length (cm)	Ovarian width (cm)
Breeding season	Ovaries with CL	R	24	3.7 ± 0.1	2.7 ± 0.14
		L	22	3.8 ± 0.1	3.2 ± 0.15
		Average	---	3.7 ± 0.1	2.9 ± 0.15
	Ovaries without CL	R	23	3.1 ± 0.1	2.5 ± 0.10
		L	25	3.9 ± 0.1	2.7 ± 0.14
		Average	---	3.5 ± 0.1	2.6 ± 0.10
Non-Breeding season	Ovaries with CL	R	17	3.3 ± 0.2	2.3 ± 0.16
		L	17	4.8 ± 0.2	3.1 ± 0.16
		Average	---	4.0 ± 0.1	2.7 ± 0.12
	Ovaries without CL	R	36	3.2 ± 0.1	2.5 ± 0.11
		L	35	3.6 ± 0.1	2.8 ± 0.12
		Average	---	3.4 ± 0.1	2.7 ± 0.08
Overall average			199	3.5 ± 0.1	2.7 ± 0.1

Overall mean of ovarian length (cm):

With CL = 3.9 R= 3.3
 Without CL = 3.5** L= 3.9**

during breeding season = 3.6
 during non-breeding season = 3.6

Overall mean of ovarian width (cm):

With CL = 2.8 R= 2.5
 Without CL = 2.6* L= 2.9**

during breeding season = 2.8
 during non-breeding season = 2.7

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بعض العوامل المؤثرة على قياسات المبيض في إناث الإبل (ذات السنم الواحد)

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الملخص العربي

تم جمع مائة وتسعة وتسعون مبيض من ١٠٢ من إناث الإبل عشوائياً من سلخانة البساتين و الوراق بالقاهرة و الجزيرة ، وتم جمع المبايض اليسرى واليمنى كل على حده بعد الذبح مباشرة ، ثم تم وضع كل منها في كيس من البلاستيك في ترمس يحتوي على محلول ملحي (كلوريد الصوديوم ٠,٩%) مضاف له المضادات الحيوية عند درجة حرارة ٢٨ م°. وقد تضمنت قياسات المبيض ما يلي: وزن المبيض ، حجم المبيض ، طول المبيض وعرض المبيض. وقد اوضحت النتائج أن: متوسط وزن المبيض ، حجم المبيض ، طول المبيض وعرض المبيض ل ١٩٩ مبيض تم جمعهم في هذه الدراسة كانت كالاتى : ٥,٦ جم ، ٥,١ سم ، ٣,٥ سم ، ٢,٧ سم ، على التوالي. ، وأن موقع المبيض كان تأثيره معنوياً بدرجة ١% على كل مقاييس المبيض التي تم دراستها ، بينما كان تأثير الحالة التناسلية وموسم السنة معنوياً بمستوى ١% على كل من وزن وحجم المبيض فقط. كما أظهرت النتائج أنه قد تم تسجيل أعلى وزن وحجم وطول للمبيض (١٠,٣ جم ، ٩,٨ سم ، ٤,٨ سم ، على الترتيب) من المبايض اليسرى التي بها جسم أصفر خارج موسم التربية أو التزاوج عن تلك التي تم تسجيلها في أى ظروف أخرى ، بينما تم تسجيل أكبر طول للمبيض (٣,٢ سم) من المبايض اليسرى التي بها جسم أصفر أثناء موسم التزاوج أو التربية . كما أظهر التحليل الاحصائي أن وزن وحجم وطول المبيض قد تأثر معنوياً على مستوى ١% بالتداخل بين موسم التزاوج وموقع المبيض والحالة التناسلية بينما لم يتأثر عرض المبيض بذلك. نستخلص من هذا البحث ان قياسات المبيض تتأثر معنوياً بموسم التزاوج والحالة التناسلية وموقع المبيض. ووجد ارتفاع في وزن وحجم وطول المبيض الأيسر المحتوي على جسم أصفر خلال موسم اللاتزاوج. كما تم تسجيل ارتفاع في عرض المبيض الأيسر المحتوي على جسم أصفر خلال موسم التزاوج.