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Research Article

BIOMETRICAL OBSERVATIONS ON THE BUFFALO OVARIES DURING DIFFERENT SEASONS

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ABSTRACT

The present study was conducted on 100 ovaries of adult buffaloes during different seasons of year viz. winter, spring, summer, rainy and autumn. Length, breadth, thickness, weight and volume of each ovary were recorded. Length of ovaries was significantly higher during winter and autumn seasons whereas average thickness was significantly higher in summer season. Also, the average weight and volume were significantly higher during summer as compared to other seasons. It was concluded that season may have significant effect on gross biometry of ovaries in buffaloes.

Key words: Buffalo ovaries, biometry, season

Gross biometry of ovaries has been studied in cyclic and non-cyclic buffaloes (Danell, 1987; Razzaque *et al.*, 2008)) and during follicular and luteal phase (Bansal, 2002). However, data on gross biometry of adult buffalo ovaries during different seasons is scanty. Therefore, the present study was conducted to observe the effect of season on gross biometry of ovaries of buffalo.

MATERIALS AND METHODS

The present study was conducted on left and right ovaries of 100 adult buffaloes during different seasons (20 in each season) of year viz; winter (November - January), spring (February – March), summer (April - June), rainy (July - August) and autumn (September - October) collected from Ghazipur Slaughter House, New Delhi. The ovarian samples were fixed in 10% neutral buffered formalin. Gross biometrical observations viz; length, breadth, thickness, weight and volume of each ovary were recorded. Thickness of the ovary (in cm) was recorded with the help of vernier caliper as the greatest distance from attached to the free borders.

RESULTS AND DISCUSSION

Ovaries in buffaloes were oval or almond shaped and attached to the meso-ovarium. The average values of weight and volume of left and right ovaries have been summarized in Table 1 and that of size (length, breadth and thickness) in Table 2. It was observed that the weight of left ovary during summer was significantly higher ($p<0.05$) than the weight during winter and spring. However, the weight of this ovary did not differ significantly ($p>0.05$) from the weight observed during rainy and autumn seasons. In right ovary, the weight observed during spring and summer seasons was significantly higher ($p<0.05$) than the weight observed during winter, autumn and rainy seasons. When the average of left and right ovaries was calculated during different seasons, the weight during summer was significantly higher ($p<0.05$) than that of other seasons. Similarly, the volume of left and right ovaries was significantly higher ($p<0.05$) during summer season than other seasons. The higher values of volume may correspond to the higher values of ovarian weight obtained during summer season.

Among the different seasons, the ovarian length was significantly higher ($p<0.05$) during winter and autumn seasons. This observation is in accordance with the findings of Ali *et al.* (2007) who also reported higher length of ovaries during peak breeding season (November-April) in camels. Except the ovarian length during winter and autumn seasons, all other values of

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Table 1
Weight and volume of left and right ovaries of buffaloes during different seasons

Season	Weight (g)			Volume (cc)		
	Left ovaries (n=20)	Right ovaries (n=20)	Average (n=40)	Left ovaries (n=20)	Right ovaries (n=20)	Average (n=20)
Winter	3.03^{a}±0.24 (1-5)	2.23^{b}±0.20 (1-3.5)	2.63^{a}±0.17	3.25^{a}±0.25 (1-5)	2.85^{a}±0.24 (1-4.5)	3.05^{a}±0.17
Spring	2.60^{a}±0.21(1-4)	3.65^{a}±0.36 (1-8)	3.13^{a}±0.23	3.03^{a}±0.16 (1.5-4.5)	3.73^{a}±0.38 (1.5-8)	3.38^{a}±0.21
Summer	3.93^{a}±0.27 (2-7)	4.35^{a}±0.29 (2-6)	4.14^{b}±0.20	4.25^{b}±0.31 (2.5-8)	4.65^{b}±0.34 (2.5-7)	4.45^{b}±0.23
Rainy	3.09^{ab}±0.34 (1.5-7.5)	2.63^{b}±0.22 (1.5-6)	2.86^{a}±0.20	3.20^{a}±0.37 (1.5-8)	2.75^{a}±0.22 (1.5-6)	2.98^{a}±0.21
Autumn	3.30^{ab}±0.37 (1.5-6.5)	2.75^{b}±0.20^{b} (1.5-5)	3.03^{a}±0.21	3.68^{ab}±0.38 (2-7)	3.32^{ab}±0.21 (2-6)	3.50^{a}±0.22

Mean values with atleast one same superscript within a column do not differ significantly (p >0.05) Figure in parenthesis indicates range.

Table 2
Length, breadth and thickness of left and right ovaries of buffaloes during different seasons

Seasons	Length (cm)			Breadth (cm)			Thickness (cm)		
	Left ovaries (n=20)	Right ovaries (n=20)	Average (n=40)	Left ovaries (n=20)	Right ovaries (n=20)	Average (n=40)	Left ovaries (n=20)	Right ovaries (n=20)	Average (n=40)
Winter	4.14^{b}±0.21	4.38^{b}±0.28	4.26^{a}±0.18	2.41^{b}±0.12	2.48^{a}±0.14	2.44^{a}±0.09	1.45^{a}± 0.06	1.47^{a}± 0.05	1.46^{a}±0.04
Spring	2.77^{c}±0.08	2.94^{a}±0.11	2.86^{b}±0.07	2.21^{ab}±0.07	2.44^{a}±0.10	2.34^{a}±0.07	1.39^{ab}±0.05	1.50^{ab}±0.04	1.45^{a}±0.03
Summer	3.22^{a}±0.12	3.05^{a}±0.13	3.14^{b}±0.09	2.44^{b}±0.12	2.58^{a}±0.10	2.51^{a}±0.08	1.53^{b}±0.05	1.65^{b}±0.07	1.59^{b}±0.04
Rainy	2.64^{c}±0.13	2.29^{c}±0.12	2.46^{c}±0.09	1.92^{a}±0.12	1.65^{b}±0.10	1.78^{b}±0.08	1.29^{c}±0.06	1.31^{c}±0.05	1.30^{c}±0.04
Autumn	4.11^{b}±0.22	4.24^{b}±0.19	4.18^{a}±0.14	2.45^{b}±0.11	2.63^{a}±0.11	2.54^{a}±0.08	1.48^{ab}±0.05	1.51^{ab}±0.05	1.49^{ab}±0.04

Mean values with atleast one same superscript within a column do not differ significantly (p > 0.05)

length, thickness and breadth recorded in the present study were comparable to earlier reports by Danell (1987), Bhardwaj (1996) and Sarkhel *et al.* (1999). Bansal (2002) reported average values of length (cm), breadth (cm) and thickness (cm) of left and right ovaries as 2.17±0.07 x 1.42±0.06 x 1.31±0.06 and 2.14±0.08 x 1.45±0.06 x 1.24±0.04 during follicular phase and 2.25±0.06 x 1.64±0.10 x 1.25±0.04 and 2.33±0.07 x 1.71±0.09 x 1.35±0.06 during luteal phase, respectively. Whereas Carvalho *et al.* (2010) reported slightly higher values of thickness of left and right ovaries (2.10±0.10 and 2.20±0.20 cm). In the present study, the average length was significantly higher ($p<0.05$) in winter and autumn seasons. The average breadth was significantly lower ($p<0.05$) in rainy season whereas average thickness was significantly higher ($p<0.05$) in summer season. From the study, it was concluded that season may have a significant effect on gross biometry of ovaries in buffaloes.

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