



Biometry of reproductive system of mithun and Tho Tho cow

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The mithun (*Bos frontalis*), a unique free – range bovine, is available in the North Eastern hill region of India. The female is slaughtered due to infertility problems and the population of mithun in NEH region is decreasing gradually due to various reasons and one is poor management of female mithun. The information about biometry of reproductive tract of mithun (*Bos frontalis*) and Nagaland local Tho – Tho cattle (*Bos indicus*) is not available in the literature. Therefore, this study was carried out aimed at providing basic information regarding the anatomical structures of normal reproductive organs of mithun and Tho Tho cattle.

The present study was carried out in and around Jharnapani mithun farm, NRC on Mithun, Nagaland, where the mithun and Tho Tho cattle were maintained. Non gravid reproductive organs of 6 mithun and 12 Tho Tho cows of approximately 5 – 6 years with body condition score = 3.5 were collected from the slaughter house around the mithun farm and used for the study. All reproductive organs were collected from the slaughter house were diestrus and free from genital abnormalities. The females were slaughtered; the genital tracts were removed, packed in ice and brought to laboratory of Animal Reproduction for biometrical studies. The biometry of reproductive organs was done as per Carvalho *et al.* (2010). The organs were cleaned and freed from adhering tissues and placed on a table in normal position. The measures of ovary were gauged by a vernier caliper. The fallopian tube was dissected and stretched out before the measurement was taken. The measurement of vulva, vagina, cervix, uterus and fallopian tube were taken with measuring tape.

The results of the different biometrical measures of reproductive tract of mithun and Nagaland Tho -Tho cattle were presented in the Table 1. There is no study on the biometry of reproductive tract of mithun and Tho Tho cattle. The left and right ovaries of mithun were larger than that of

Tho Tho cattle in terms of length, width, thickness and weight. The right ovary of mithun was larger than left ovary as in cattle. The mean length of ovary recorded in the present study fall within the range (2.59 to 3.31) of the results of Arthur *et al.* (1989) in cattle. The width of the ovary as recorded in the present study was in agreement with the

Table 1. Biometry of reproductive organs of mithun (*Bos frontalis*) and Tho Tho cattle (*Bos indicus*)

Organs	Measures	Mithun (<i>Bos frontalis</i>) (n=6)	Tho Tho Cattle (<i>Bos indicus</i>) (n=12)
Left ovary	Length (cm)	2.73±0.14	2.52±0.13
	Width (cm)	1.78±0.45	1.43±0.05
	Thickness (cm)	1.59±0.42	1.38±0.14
	Weight (gms)	3.93±0.60	3.45±0.26
Right ovary	Length (cm)	3.02±0.29	2.78±0.27
	Width (cm)	1.74±0.27	1.45±0.37
	Thickness (cm)	1.72±0.62	1.47±0.38
	Weight (gms)	4.45±1.22	3.88±0.52
Left oviduct	Length (cm)	33.45±5.67	21.45±0.64
	Diameters (cm)	0.31±0.11	0.34±0.22
Right oviduct	Length (cm)	35.19±5.95	21.80±0.58
	Diameters (cm)	0.30±0.12	0.33±0.38
Left uterine horns	Length (cm)	20.86±0.19	19.20±2.12
	Width (cm)	5.99±0.35	5.74±0.54
	Thickness (cm)	0.45±0.12	0.45±0.26
Right uterine horns	Length (cm)	21.20±2.17	21.14±0.16
	Width (cm)	6.20±0.33	6.29±0.17
	Thickness (cm)	0.49±0.10	0.52±0.10
Corpus uterus (body of uterine horn)	Length (cm)	5.55±0.72	2.12±0.92
	Width (cm)	1.95±0.39	2.75±0.52
	Thickness (cm)	0.50±0.09	0.57±0.02
Cervix	Length (cm)	6.20±0.42	7.82±0.49
	Width (cm)	2.19±0.19	2.73±0.24
	Thickness (cm)	1.12±0.18	1.29±0.12
	Number of annular rings	(3.17±0.37)	(3.79±0.28)
Vagina	Length (cm)	21.85±2.12	20.74±1.93
	Width (cm)	4.82±1.78	5.08±1.84
	Thickness (cm)	0.40±0.06	0.52±0.27
Vulva	Length (cm) (Ventral)	14.37±3.32	12.24±2.75
	(Dorsal)	12.50±3.73	10.38±2.89
	Thickness (cm)	0.20±0.01	0.28±0.04
Number of uterine caruncles		126.15±19.51	117.32±15.35

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results (1.3 to 1.9 cm) of Salisbury and Vandemark (1961) and Roberts (1982) in cattle. The thickness of the ovary was found in the present study was in the range of those (1.17 to 2.34 cm) recorded by Salisbury and Vandemark (1961) and Arthur *et al.* (1989) in cattle. The present findings (3.33 to 5.67 g) are not similar to those reported by Salisbury and Vandemark (1961) and Roberts (1982) in cattle. This discrepancy in the parameters could be due to variation between *Bos indicus* and *Bos frontalis* as *Bos indicus* breeds are generally smaller and lighter than those of *Bos frontalis* as *Bos taurus* (Sloss and Dufty 1980). It was concluded that the left ovary was shorter in length, narrower in diameter and lighter in weight to that of right ovary in both mithun and Tho Tho cattle. This confirms that the right ovary is more active than the left ovary as in cattle (Ahmed *et al.* 2000).

The oviducts are paired convoluted tubes connecting the uterus to the ovaries. The length and diameter of oviduct were higher in mithun as compared to cattle and right duct is lengthier than left duct in both mithun and cattle. The results of the present findings were similar to reported by Sission and Grossman (1972) and Roberts (1982) as in cattle. The length, width and thickness of uterine horn of mithun is larger than the Tho Tho cattle, and right was more in size than left oviduct in both mithun and cattle. Our results (21.32 to 23.37 cm) were similar to reports of Roberts (1982). However, higher values were recorded by Sission and Grossman (1972) and Sorensen (1988). The difference in values could have been due to age, breed, fertility status and shrinkage of the endometrium.

In mithun and cattle, 2 horns join together to form a body of the uterus that is situated in between os – internum and true bifurcation of the cornuea. Body of uterus was lengthier in mithun than in cattle but diameter and thickness was more in cattle than mithun. Length, width and thickness were higher in Tho Tho cattle than in mithun. Our results (4.83 to 6.27 cm) were in agreement with Sission and Grossman (1972) and Sorensen (1988) as in cattle. The findings for the width of the present study were agreement to the results reported by Sorensen (1988) in cows. Cervix is a sphincter muscle like structure, which forms a physiological barrier between the vagina and uterus. The length recorded in this study was in agreement with the results (6.27 cm) obtained by Garcia (1988) in cows. Number of cervical rings was higher in cattle (3.79) than in mithun (3.17). The vagina is a tubular sheath like structure, which extends from the cervix to the urethral opening. The length of vagina is lengthier in mithun than in cattle but the diameter and thickness was more in cattle. These results were in agreement with the results (17.5 to 25 cm) reported by Roberts (1982) in cattle. Vulva is external portion of the tract that extends from the vaginal to external opening. The length of vulva was more in mithun than cattle but the thickness was more in cattle. The results of vulva in mithun were in agreement with the results of Sission and Grossman (1972) and Roberts (1982) in cattle.

From the present study, it is concluded that biometry of reproductive organs of mithun are larger as compared to the Tho Tho cattle. Right ovary, oviduct and uterine horn are lengthier, wider, thickened and weightier than left in both mithun and Tho Tho cattle. However, the data presented may provide base line information about the biometrical structure of various parts of the reproductive organs of the mithun and Tho Tho cattle. This may help to diagnose and treat various reproductive problems at early stage to improve the reproductive performance and reduce infertility problem in mithun and Tho Tho cattle.

SUMMARY

The present study of biometrical measurement of reproductive organs of diestrus mithun (6) was carried out in comparison with local Nagaland Tho Tho cattle (12) of approximately 5–6 years with body condition score of 3.5. The measures of ovary were gauged by a vernier caliper. The measurement of vulva, vagina, cervix, uterus and fallopian tube were taken with measuring tape. The study was concluded that biometry of reproductive organs of mithun were larger as compared to the Tho Tho cattle. Right ovary, oviduct and uterine horn are lengthier, wider, thickened and weightier than left in both mithun and Tho Tho cattle. This may help to diagnose and treat various reproductive problems at early stage to improve the reproductive performance and reduce infertility problem in mithun and Tho Tho cattle.

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