

Biometrical Study on Normal Spleen of Cattle

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Abstract: This research work was conducted on 104 cattle, 52 from each male and female, slaughtered at different slaughter houses of Hyderabad city. The mean length of spleen of male cattle at the age of 2, 3, 4 and 5 years was 39.09 ± 0.05 cm, 44.75 ± 1.67 cm, 45.5 ± 4.26 cm and 51.5 ± 0.85 cm respectively, while that of female was 38.87 ± 0.21 , 43.25 ± 2.91 , 43.34 ± 1.43 and 45.30 ± 0.68 cm respectively. The mean width of spleen of male cattle at the age of 2, 3, 4 and 5 years was 10.25 ± 0.22 cm, 10.85 ± 0.11 cm, 11.92 ± 0.41 cm and 12.66 ± 0.27 cm respectively. While that of female was 10.58 ± 0.14 cm, 10.82 ± 0.31 , 10.88 ± 0.24 cm and 10.96 ± 0.24 cm respectively. The mean thickness of male cattle at the age of 2, 3, 4 and 5 years was 1.85 ± 0.02 cm, 1.9 ± 0.14 cm, 2.2 ± 0.35 cm and 2.26 ± 0.07 cm respectively, while that of female was 1.86 ± 0.14 cm, 1.92 ± 0.11 cm, 1.93 ± 0.75 cm, 2.23 ± 0.10 cm respectively. The mean weight of spleen of male cattle at the age of 2, 3, 4 and 5 years was 395.70 ± 9.41 g, 401.5 ± 42.91 g, 571.75 ± 37.16 g and 734.19 ± 29.47 g whereas that of female cattle in these groups was 377.05 ± 6.75 g, 455.87 ± 5.76 g, 518.81 ± 15.93 g and 572.73 ± 5.87 g respectively. A significant increase in the mean length, thickness and weight of spleen of both sexes of cattle was observed as their age increased. A significant increase in the mean width of spleen of male cattle was noted as the age of the animal increased, while little increase in the mean width of female cattle was observed as their age advanced which was statistically nonsignificant.

Key words: Normal, spleen, cattle, biometry

Introduction

Spleen is an important lymphoid organ, which filters blood, removes iron from hemoglobin, produces lymphocytes and antibodies. It also releases blood with a high concentration of corpuscles (Gardner *et al.*, 1969). It is the part of reticulo-endothelial system (Loeffler, 1986). The knowledge regarding biometry of spleen is necessary for correct diagnosis and treatment of various bacterial, viral and parasitic diseases of the cattle in which the spleen becomes either enlarged or atrophied. The literature regarding the biometry of spleen of indigenous breeds of cattle is yet scanty in this country and as such, it was considered necessary to undertake the present study. The present study would also be of interest for Meat inspectors and other persons involved in providing good quality meat for human consumption.

Materials and Methods

One hundred and four normal fresh spleens, 52 from each male and female cattle of different ages were collected randomly from slaughter house of Hyderabad city for biometrical study. The age of each animal was determined by observing the eruption of incisor teeth according to the formula presented by Bone (1979). The spleen having no gross abnormalities or pathological lesions were removed from the carcasses, packed into the polythene bags and brought to the Laboratory of Anatomy and

Histology, Faculty of Animal Husbandry & Veterinary Sciences, Sindh Agriculture University, Tando Jam. Spleens were cleaned and free from adhering tissues and placed on surgical table in their normal position. The measurements of spleen were taken according to the technique followed by Sisson and Grossman (1964), Wilson (1975) and subsequently followed by Ommer and Harshan (1995). The length, width and thickness were measured in centimeters with the help of nylon tape and a Vernier caliper, while the weight was recorded in grams by using triple beam balance. Finally the data regarding biometry of spleen were arranged in tabular form and statistically analyzed as per MSTAT-C Microcomputer program.

Results and Discussion

Table 1 and 2 show the mean weight, length, width and thickness of spleen of male and female cattle at the age of 2, 3, 4 and 5 years. The mean weight of spleen of male cattle at the age of 2, 3, 4 and 5 years was recorded as 395.70 ± 9.41 g, 431.5 ± 42.91 g, 571.75 ± 37.16 g, 734.19 ± 29.47 g respectively. While in case of female cattle, the mean weight of spleen recorded as 377.05 ± 6.75 g, 455.88 ± 5.76 g, 518.81 ± 15.93 and 572.73 ± 5.87 g. The mean length of spleen male cattle at the age of 2, 3, 4 and 5 years measured as 39.09 ± 0.05 cm, 44.35 ± 1.67 cm, 45.5 ± 4.26 cm and 43.25 ± 2.92 cm, 43.34 ± 1.43 cm and 45.30 ± 0.688 cm respectively.

Table 1: The mean length, width, thickness and weight of spleen of male cattle at different age groups

Measurements (cm)	at 2 years (n=24)	at 3 years (n=2)	at 4 years (n=2)	at 5 years (n=24)
Mean length $\pm$ S.E	39.09 $\pm$ 0.05	44.75 $\pm$ 1.67	45.5 $\pm$ 4.26	51.5 $\pm$ 0.85
(Range)	(32.5-43.9)	(42.0-46.7)	(39.5-51.5)	(41.5-62.2)
Mean width $\pm$ S.E	10.25 $\pm$ 0.22	10.82 $\pm$ 0.11	11.92 $\pm$ 0.41	12.66 $\pm$ 0.027
(Range)	(8.1-13.0)	(10.7-11.0)	(11.33-12.5)	(10.5-16.2)
Mean thickness $\pm$ S.E	1.85 $\pm$ 0.02	1.9 $\pm$ 0.14	2.2 $\pm$ 0.35	2.26 $\pm$ 0.07
(Range)	(1.4-2.4)	(1.7-2.1)	(1.7-2.7)	(1.7-3.3)
Mean weight (g) $\pm$ S.E	395.70 $\pm$ 9.41	401.5 $\pm$ 42.91	571.75 $\pm$ 37.16	734.19 $\pm$ 29.47
(Range)	(221.6-563.3)	(341.0-462.0)	(519.5-624)	(520.7-1064.5)

Table 2: The mean length, width, thickness and weight of spleen of female cattle at different age groups

Measurements (cm)	at 2 years (n=19)	at 3 years (n=4)	at 4 years (n=7)	at 5 years (n=22)
Mean length $\pm$ S.E	38.87 $\pm$ 0.21	43.25 $\pm$ 2.91	43.34 $\pm$ 1.43	45.30 $\pm$ 0.68
(Range)	(33.5-44.5)	(37.5-53.0)	(40.0-50.8)	(39.5-52.0)
Mean width $\pm$ S.E	10.58 $\pm$ 0.14	10.82 $\pm$ 0.31	10.88 $\pm$ 0.24	10.96 $\pm$ 0.24
(Range)	(9.0-12.3)	(10.1-11.66)	(9.7-11.8)	(9.33-12.7)
Mean thickness $\pm$ S.E	1.86 $\pm$ 0.14	1.92 $\pm$ 0.11	1.93 $\pm$ 0.75	2.23 $\pm$ 0.10
(Range)	(1.4-2.4)	(1.7-2.3)	(1.5-2.2)	(1.9-3.0)
Mean weight (g) $\pm$ S.E	377.05 $\pm$ 6.75	455.875 $\pm$ 5.76	518.81 $\pm$ 15.93	572.73 $\pm$ 5.87
(Range)	(210.5-550.8)	(443.8-472.0)	(455.0-593.0)	(431.5-891)

Table 3: Correlation analysis between various variables of spleen of male cattle

Variables	"r" values	Remarks
Length of spleen and age of animal	0.855	**
Width of spleen and age of animal	0.688	**
Thickness of spleen and age of animal	0.529	**
Weight of spleen and age of animal	0.748	**

r= Correlation Coefficient

** = Highly Significant at 5% level

Table 4: Correlation analysis between various variables of spleen of female cattle

Variables	"r" values	Remarks
Length of spleen and age of animal	0.591	**
Width of spleen and age of animal	0.205	NS
Thickness of spleen and age of animal	0.533	**
Weight of spleen and age of animal	0.702	**

r= Correlation Coefficient

** = Highly Significant at 5% level

NS= Non-significant

The mean width of spleen of male cattle at the age of 2, 3, 4 and 5 years measured as 10.25 $\pm$ 0.22cm, 10.82 $\pm$ 0.11cm, 11.92 $\pm$ 0.415cm and 12.66 $\pm$ 0.27cm, while that of female cattle measured as 10.58 $\pm$ 0.14cm, 10.82 $\pm$ 0.314cm, 10.88 $\pm$ 0.24cm and 10.96 $\pm$ 0.24cm respectively. The mean thickness of the spleen of male cattle at the age of 2, 3, 4 and 5 years in the present study recorded as 1.85 $\pm$ 0.22cm, 1.9 $\pm$ 0.14cm, 2.2 $\pm$ 0.35cm and 2.26 $\pm$ 0.076cm, while that of the female was observed as 1.86 $\pm$ 0.02cm, 1.92 $\pm$ 0.112cm, 1.93 $\pm$ 0.079cm and 2.23 $\pm$ 0.11 respectively.

The present findings regarding length, width and thickness of spleen are coincided with those of

Gates (1953) and Ommer and Harshan (1995). Gates (1953) reported that the spleen of cattle was 40-50cm long, 12cm thick. Ommer and Harshan (1995) measured the length of spleen that range from 41-50cm, where the width and thickness ranged from 11-14.5cm and 2-3 respectively. The weight of spleen recorded in present study is in partial agreement to those of Gates (1953), Ommer and Harshan (1995) and Frandson (1986) weighed the spleen of cow in the range of 700-1100g. The results regarding the biometry of spleen recorded in this study are in line with those of the above workers for adult cattle.

During the present biometrical study, significant

increase in the mean length, thickness and weight of spleen of both sexes of cattle was observed as the age of the animal advanced, significant increase in the mean width of spleen of male cattle was recorded as correlated with the age of the animals. However, little increase was observed in the mean width of spleen of female cattle with the advancement of their ages which was statistically nonsignificant.

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