PELVIMETRY IN SWAMP BUFFALO AND INDIGENOUS CATTLE COW

เชิงกรานของกระบือปลักและโคพื้นเมือง

Peerasak Chantaraprateep
พีระศักดิ์ จันทร์ประทีป

Prasert Prateep
ประเสริฐ ประทีป

Chainarong Lohachit
ชัยณรงค์ โลหชิต

Prasit Bodhipaksha
ประสิทธิ์ โพธิบักษ์

Prachin Virakul
ปราจีน วีรกุล

Annop Kunavongkrit
อรรณพ คุณาวงศ์กฤต

Department of Obstetrics–Gynaecology and Reproduction, Faculty of Veterinary Science, Chulalongkorn University, Bangkok Metropolis 10500

ภาควิชาสูติศาสตร์ – เธนุเวชวิทยาและวิทยาการสืบพันธุ์ คณะสัตวแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย กท. 10500

Abstract

Pelvimetry of swamp buffalo and indigenous cattle cows was conducted. Twenty swamp buffalo cows aged between 3 to 13 years and weighed between 250 to 500 kg and 12 indigenous cows aged between 3 to 5 years and weighed between 160 to 200 kg were used in this study. Parameters studied were: the greatest transverse dorso–ventral diameters of the pelvic, pelvic outlet, vertical diameter, diagonal diameter and pelvic inlet.

Introduction

Previous report on normal parturition in 20 swamp buffalo cows in Surin and Nakhorn Pathom by Mathias *et al.* (1980) indicated advantage of this animal in term of parturition. However, Chantaraprateep *et al.* (1981) described 2 cases of dystocia dued to oversize foetus in buffalo heifer and abnormal presentation of the foetus in a cow of this species. Furthermore, a rare case of dystocia (Chantaraprateep and Prateep, 1982) dued to abnormality (hydrocephalus) of foetus was also reported.

The present study was aimed to compare pelvimetry of mature Thai swamp buffalo and indigenous cows. It might be useful further investigation and reference.

Materials and Method

All pelvices of both swamp buffaloes and cattle cows were collected from a slaughter house, Nakhorn Pathom. Twenty swamp buffalo cows aged between 3 to 13 years and weighed between 250 to 500 kg together with 12 indigenous cows aged between 3 to 5 years and weighed between 160 to 200 kg were included in this studies.

Pelvimetry was performed while the specimens were fresh from the slaughter house.

Measurements were carried out on:

1. Transverse diameter or greatest transverse or bisiliac (A).
2. Dorso–ventral of the pelvic or conjugate diameter (B).
3. The pelvic outlet was measured from the pubic and ischial bone as the ventral wall or floor to the second coccygeal vertebra dorsally (C).
4. The vertical diameter measured from the middle of the pubic symphysis to the junction of the second and third sacral segment (D).

5. Diagonal diamenter measured from the anterior end of the symphysis to the junction of the third and fourth sacral segment (E).

6. Vertical diameter measured from the anterior end of the symphysis to the first sacral segment (sacro–pubic or pelvic inlet) (F).

Differences of means of measurement between the 2 species were compared by using unpaired t test (Snedecor and Colchran, 1980).

Results and Discussion

Comparison of pelvimetry of swamp buffalo and indigenous cows is shown in table 1.

The abbreviations used in table 1 figures 1 and 2 represent :

A : Transverse or bisiliac or greatest diameter

B : Dorso–ventral (Sacro–pubic) or conjugate diameter of the pelvic

C : Pelvic outlet

D : Vertical diameter

E : Diagonal diameter

F : Pelvic inlet

Table 1. Comparison of body weight and pelvimetry of swamp buffalo and Thai indigenous cows.

Species	Age (years)	Bodyweight (kg)	Pelvimetry (cm) A	B	C	D	E	F
Buffalo Cows	3.5±0.8 (3–5) n=8	286±21.9[1)] (250–300)	17.2[1)] ±0.8 (16–18)	20.3[3)] ±1.0 (19–21)	20.4[5)] ±1.6	22.4[7)] ±1.1	19.3[9)] ±1.0	23.9[5)] ±1.6
	9.3±1.4 (6–13) n=12	429±66.9 (>300–500)	19.5 ±1.3 (17–21)	24.3 ±1.7 (21–27)	23.1 ±1.6	25.8 ±1.4	22.3 ±1.4	28.0 ±1.5
Cows	4.1±0.8 (3–5) n–12	178.3±14.0[2)] (160–200)	13.2[2)] ±0.7	19.3[4)] ±1.1	18.1[6)] ±1.3	21.0[8)] ±1.3	17.5[10)] ±0.8	21.7[6)] ±0.8

1) and 2) in each column is significantly different ($p < 0.001$)

3) and 4) in each column is significantly different ($p < 0.10$)

5) and 6) in each column is significantly different ($p < 0.01$)

7) and 8) in each column is significantly different ($p < 0.05$)

9) and 10) in each column is significantly different ($p < 0.005$)

Figure 1. The pelvic bones of the swamp buffalo cow (view from infront), through which the calf must pass at birth. The arrows indicate the greatest transverse (A) and dorsoventral diameters (B) of the polvic girdle.

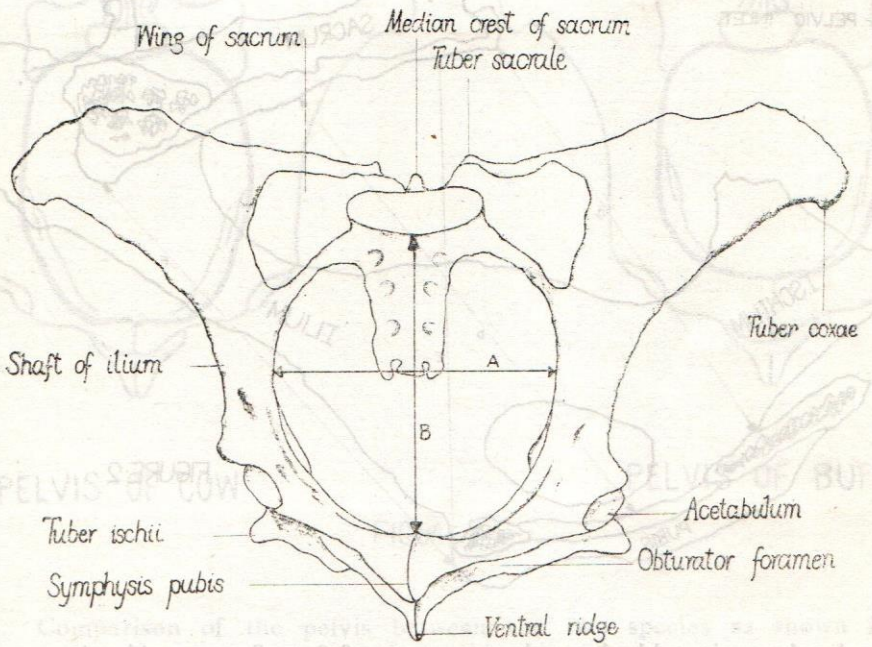
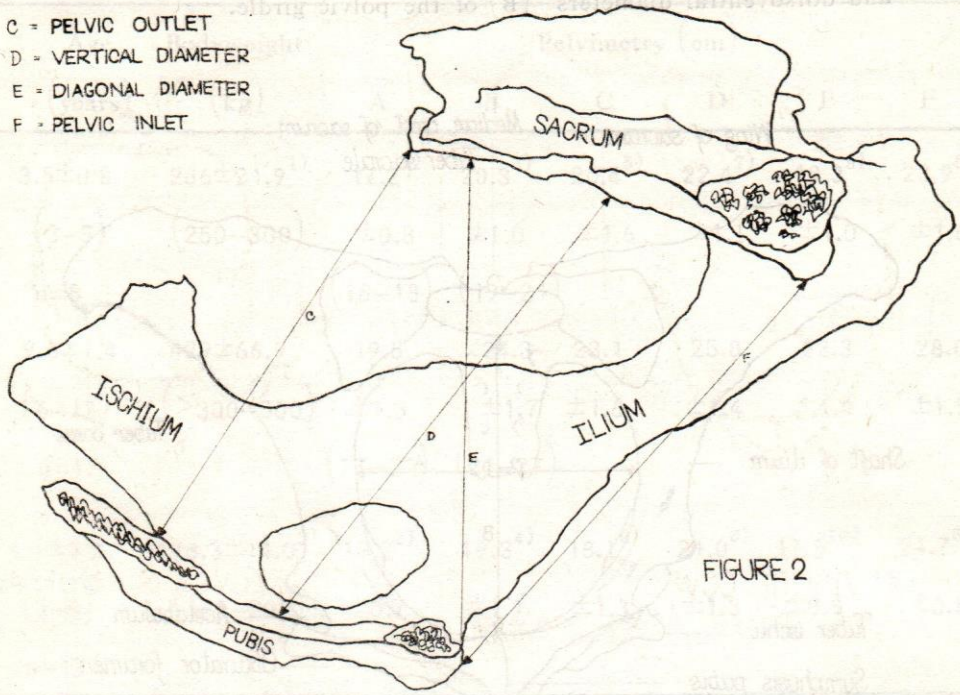


FIGURE 1

Figure 2. Diagram indicates different lines which join important sites of pelvic bones of swamp buffalo.



As shown in table 1, at the same age of 3 to 5 years old, the average body weight of swamp buffalo cows was heavier $(p < 0.001)$ than those in the cattle cows. The finding in terms of transverse diameter (A) and dorso–ventral of the pelvic (B) as depicted in table 1 and figure 1 of which these in swamp buffalo cows were greater than those observed in the cattle cows $(p < 0.001$ and $p < 0.10)$ respectively. The differences of the means of pelvic outlet (C), vertical diameter (D), diagonal diameter (E) and pilvic inlet (F) as shown in table 1 and figure 2 were also greater in swamp buffalo cows than cattle cows $(p < 0.01,\ p < 0.05,\ p < 0.005,$ and $p < 0.01)$ respectively. In case of older swamp buffalo cows, they were obviously heavier in body weight and greater in terms of the 6 measurements studied than those in the cattle cows. However, comparison was confined only between the 2 species with relatively similar age.

Figure 3. Comparison of pelvic girdle between swamp buffalo cow and Thai indigenous cow.

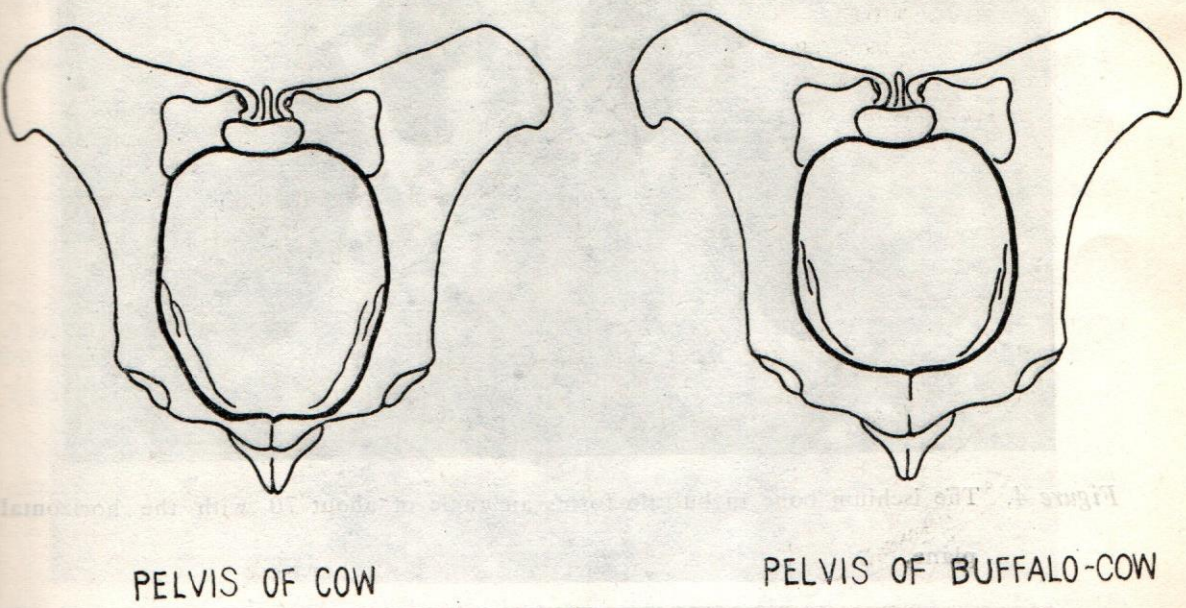


FIGURE 3

Comparison of the pelvis between the two species as shown in figure 3, clearly demonstrated 2 interesting observations. Firstly, the shape of the pelvic inlet of swamp buffalo cow is more oblique and almost circular while in the cattle it is elliptical. Secondly, the sacrum of the cow consists of five segments, fused completely and involves the spinous processes which are united to form a median sacral crest (Sisson, 1970). While in the swamp buffalo cow it consists of 4 segments, only one of 30 pelvices studied that has first coccygeal vertebra attached. Other characters : facet of the thoracic sacrum it is oval in buffalo while in the cattle it is curved and sickle shape.

Ischium bone in buffalo forms an angle of about 70 degrees with the horizontal plane as shown in figure 4 while in cattle it forms about 50 degrees angle or V shape as shown in figure 5.

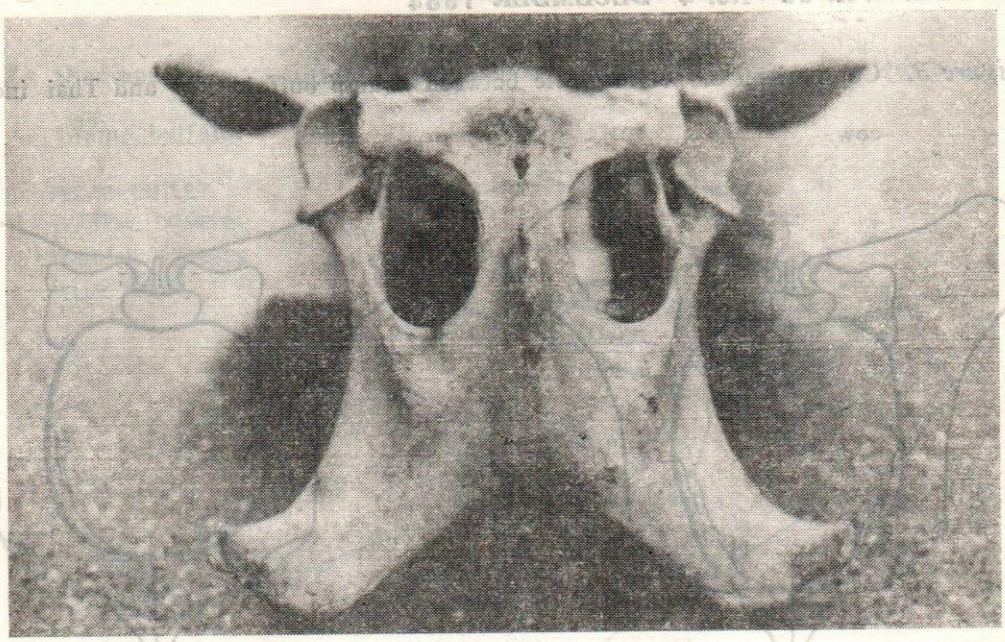


Figure 4. The ischium bone in buffalo forms an angle of about 70° with the horizontal plane.

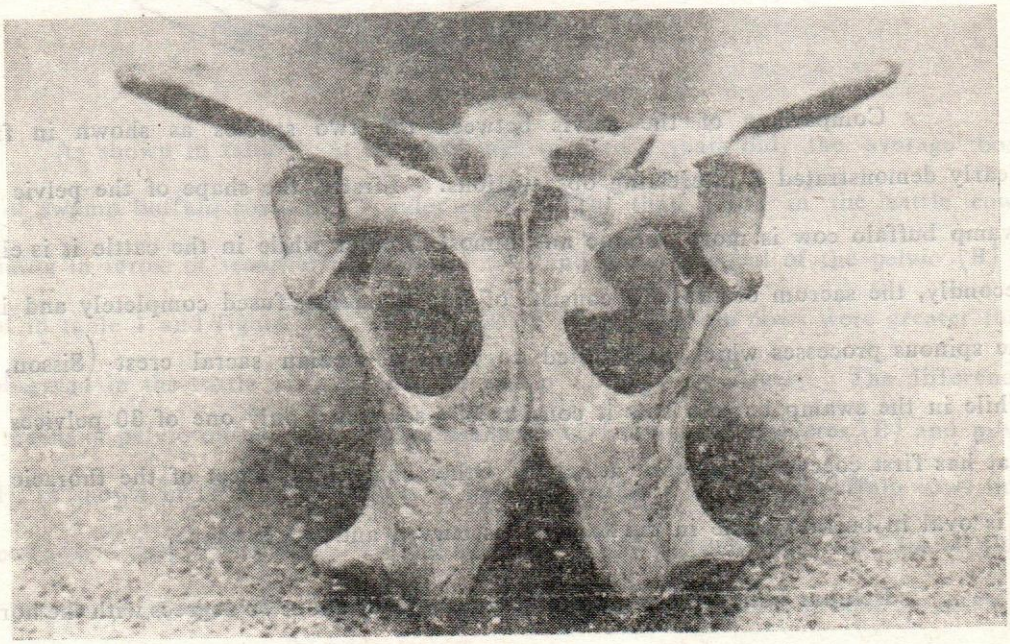


Figure 5. The ischium bone in cattle forms about 50° angle or V–shape.

The tuber ischii is large and y shape in swamp buffalo (figure 6) while in cattle it s almost three sided equally (figure 7).

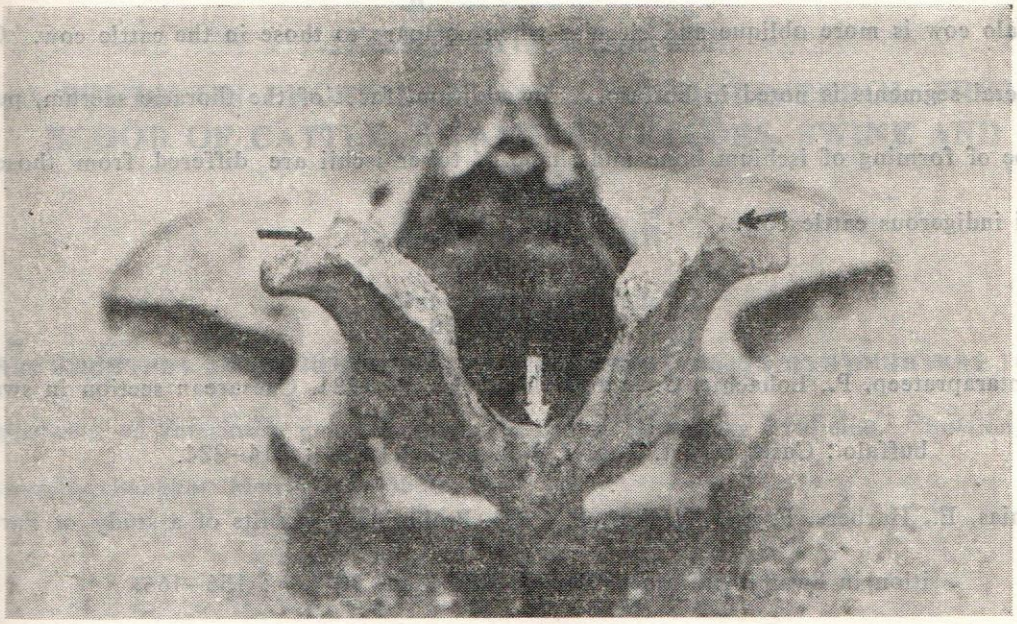


Figure 6. The tuber ischii is large and y shape in swamp buffalo.

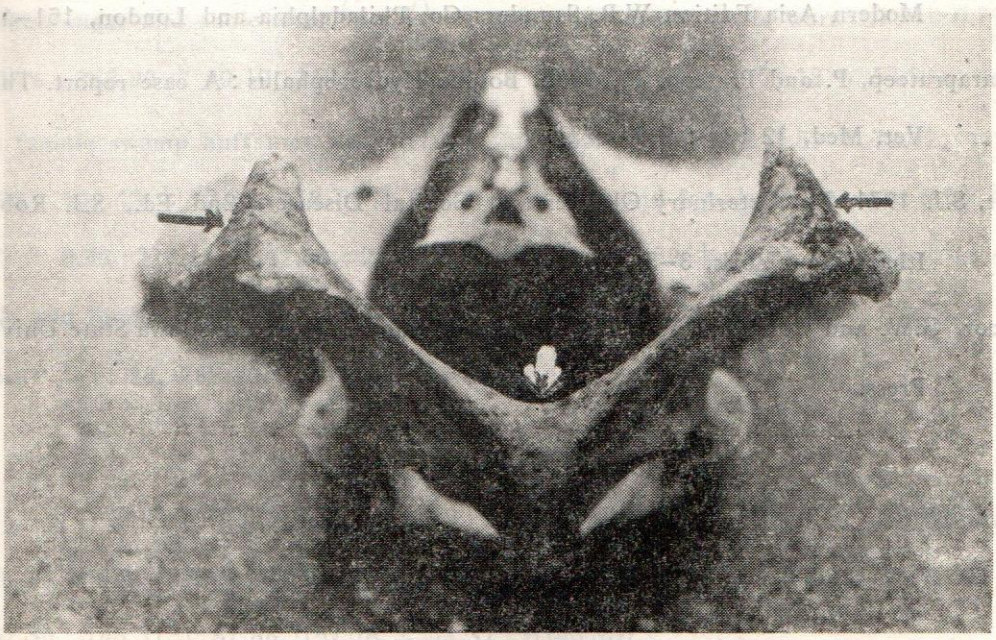


Figure 7. The tuber ischii in cattle is almost three sided equally.

The present findings revealed that, at similar age and body weight, the pelvimetry of swamp buffalo cow is greater than those in cattle cows. The pelvic inlet of swamp buffalo cow is more oblique and circular when compare to those in the cattle cow. Only 4 sacral segments is noted in buffalo. In addition, facet of the thoracic sacrum, pubis, shape of forming of ischium bone and shape of tuber ischii are differed from those in Thai indigerous cattle cow.

References

Chantaraprateep, P., Lohachit, C. and Bodhipaksha, P. 1981. Caesarean section in swamp buffalo : Cases report. Thai J. Vet. Med. 11 (3) : 214-224.

Mathias, E., Harbers, F. and Virakul, P. 1980. Preliminary Results of a study of Parturition in Swamp Buffaloes. Thai J. Vet. Med, 10 (3) : 156-166.

Sisson, S. and Grossman, J.D. 1970. In: The Anatomy of the Domestic Animals. 4th Ed., Modern Asia Edition W.B. Saunders Co, Philadelphia and London, 151-153.

Chantaraprateep, P. and Prateep, P., 1982. Bovine Hydrocephalus : A case report. Thai J. Vet. Med, 12 (3) : 217-222.

Robert, S.J. 1971. In : Veterinary Obstrics and Genital Diseases. 2nd Ed., S.J. Roberts. Ithaca New York, 3-5.

Snedecor, G.W. and Colchran, W. 1980. Statistic Methods. 7th edition. Iowa State University Press.