قسم: التوليد والتلقيح الصناعي
كلية: الطب البيطري - جامعة أسوان
رئيس القسم: أ. د. محمد عبد الرحمن النجار

تربيه الجاموس في صحراء الوادي الجديد - مصر
(نموذج التكاثر والانتاج)

محمود عثمان

كانت أول محاولة لتربيه الجاموس في الصحراء بنا على معدلات التكاثر ونتائج اللعيم في الفترة من 1984 وحتى 1986 في واحة الخارجة بمحافظة الوادي الجديد بمصر وذلك باستخدام التلقيح الطبيعي، الا أنه أدى الى ضعف الخصوبة وزيادة نسبة النفوق في العجل.

واعتبارا من 1981 وصفة د ريجيم اجراء الفحص التناسلي والطبي للتغلب على تلك المشاكل، وأسفر الفحص الكلينيكي للطلائق الجاموس المستخدمة عن تفعيلها بحالة طبيعية في كل من الأعضاء التناسلية والسائل المنوي.

وقد ارتفعت نسبة الحبل بعد المتابعة والفحص الدوري من 20% إلى 78 ر. 1%, بينما انخفضت نسبة النفوق بين العجل من 92% إلى 51%. كذلك انخفض العمر عند أول ولادة بالفترة بين ولادة إلى 49 شهرًا إلى 44 شهرًا 58 يوماً بالترتيب.

وقد أمكن الحد من حالات حمول الصابيع والتهاب الرحم المزمن باستخدام هرمتي فوسفات الصوديوم و ب. ن. ف.

وارتفاع معدل انتاج اللعيم اليومي من 1.5 إلى 5.7 كيلو جرام، مما أدى الى ارتفاع الانتاج خلال موسم الحليب من 2.4 كيلو جرام إلى 5.7 كيلو جرام.

والنتائج أيضا بلغت الطولقة من العمر 11 عاماً ولا يزال نشطا جنسياً، وكذلك بلغت أكبر جاموسية 13 عامًا وهي عشار وقد أعطت 8 ولادات سابقة.
BREEDING BUFFALOES IN THE NEW VALLEY DESERT AREA OF EGYPT
(PATTERN OF REPRODUCTION AND PRODUCTION)
(With 7 Tables)

By

A. M. OSMAN
(Received at 24/9/1984)

SUMMARY

As a first successful trial to breed buffaloes in the desert, the pattern of reproduction and milk production was investigated in a local farm, from 1974 - 1983, at El-Kharga oasis of the New Valley Governorate of Egypt. Natural breeding was practiced but the farm complained from low fertility and high incidence of calf mortality. Routine gynaecological and medical care was applied after 1981 to resolve both problems. The clinical examination of the 2 breeding buffalo bulls revealed their normal enitalia and semen picture. After care the incidence of pregnancy increased from 50.2% to 78.6% while the calf mortality decreased from 19.2% to 1.5%. The age of first calving and the calving intervals decreased from 49 to 44 months and from 582 to 472 days respectively. The first calving interval was the shortest among consecutive calvings (442 days). The incidence of ovarian inactivity and chronic endometritis was 1.3% and 14.3% respectively. Dibasic sodium phosphate and P.N.F. gave good results for the treatment of both conditions respectively.

The total milk yield increased gradually till the 4th lactation (1864 kg) while the lactation length reached its maximum average value at the 5th lactation (311 days). After care the milk yield per day and per 305 days increased from 5.1 to 5.5 kg and from 1564.6 to 1707.5 kg respectively. The maximum daily milk yield reached 14 kg in few individuals.

The weight of male and female calves at birth averaged 32.0 and 31.5 kg respectively. The calculated gain in live weight for growing males averaged 0.56, 0.45 and 0.34 kg till the age of 2, 2.5 and 3 years respectively. The adult male and female buffaloes weighed 620 and 594 kg in average respectively. The elder bull aged 11 years and still active while the elder cows aged 13 years 6 months with 6 previous calving and still pregnant.

INTRODUCTION

It is generally accepted that water buffaloes were introduced to Egypt from India through Iraq after the Arab invasion about the middle of the seventh century. The established them selves quickly in the favourable environment of the River-Nile Valley to become now the most important animals in the country (2.4 million in recent population). About 63% of Egyptian buffaloes are in low Egypt, 20% in Middle Egypt and 17% in Upper Egypt (SIDKY, 1951).

ASKER, RAGAB and GHANY (1953) measured the heat tolerance of buffaloes to be much less than that of Shorthorn and Egyptian Cattle. Moreover, BADRELDIN and GHANY (1952) and TANEJA and BHATNAGAR (1960) advised to try to keep buffaloes cool by the application of water, sprayin or wallowin especially in hot weather or sun. MACGREGOR (1939) cited that buffaloes are found under their usual habitat in river valleys, wet cultivation, thick forest, islands, marshy areas, swamps, savannah, bush and rainy wet places. The review of MASON (1974) denotes that water buffaloes have not yet live in desert areas.

HASSAN (1982) mentioned that the first importations of buffaloes to the Western Desert of Egypt (Elkharga of the New Valley Province) occurred in 1959 with farmers migrated from Upper Egypt through the General Desert Development Organization. The exact numbers of buffaloes at that time were unknown. In recent report from Elkharga Veterinary Service (1983), the population of buffaloes reached 1000 compared to 21,000 native Cattle. The aim of the present work is to study the pattern of reproduction and milk production in Water Buffaloes bred in a local Governmental farm in the dry Western desert area of Egypt (Elkharga oasis of the New Valley Governorate).

**MATERIAL and METHODS**

In 1974, the Governorate of the New Valley Province brought 8 Behari buffaloes from Socha, Kafrelsheikh Province at Loer Egypt, for breeding in a local farm at Elkharga. The exact birth dates of these animals were unknown and they were supposed to be pregnant. Two buffalo bulls came to the farm from the same place. One year later, 10 buffalo cows purchased from the neighbour farmers were added to the farm. All animals were T.B. and Brucella free and sprayed against ectoparasites periodically through a local Veterinary Service. Hand milking occurs twice daily and natural breeding was practiced.

The farm administration complained from low fertility and high mortality of the newly-born calves. In MARCH, 1981, a scheme was suggested to resolve both problems, since breeding in fact was almost haphazard. As this was the first trial to breed buffaloes in the desert, the daily air temperatures and humidity were obtained from the Weather observatory Centre at Elkharga. The work in the farm was performed as follow:

**Buffalo bulls:**

Thorough andrological examinations including semen evaluation were made after OSMAN (1965) and LAING (1979). Each one of the bulls runs reciprocally with the herd during the day.

**Buffalo cows:**

Thorough gynaecological examinations were made monthly (as possible) after EL-WISHY (1965). Gynaecological sheets were used to record the reproductive conditions of the animals at each examination. According to the examinations, the buffaloes were divided into pregnant and non pregnant (cyclic and acyclic) groups. Dibasic Sodium Phosphate (20 g daily for two weeks mixed with the ration) was used to treat cases with ovarian inactivity. PNF (procaine penicillin G, Neomycin sulphate, 5-nitro-Furoldehyde semicuraronz) with predniizone (Marck, Sharp and Dohme, München, Germany) was used to treat chronic endometritis after ABDELLAH (1980).

Newborn Calves:

These were allowed to feed the colostrum immediately after calving and for 3-4 days. In a suitable room with clean rice straw bedding, the calves stayed most of their times. They were allowed to feed their mother's milk 2-3 times daily either by nursing or by hand feeding. They were fed about 6 - 10% of their live weights milk during the 2 - 3 months weaning period (MOHAMED, 1980). The calves were then, fed long hay and gradually turned to the normal ration. During this critical period of their life, the calves stayed few hours daily in the sun or under shade according to the hotness of the weather.

Milk production:

The milk yield of the lactating cows was calculated per day, per lactating season and per 305 days before and after 1981 (the time of our observation to the farm). Cows gave less than 5 kg milk per day were discarded from the farm when possible.

Herd records:

The data collected were from 1974 to 1983. The number of alive and discarded buffaloes were taken annually. Pregnancy rate, calving rate and the incidence of calf mortality and dystocia were analysed. The live weights of male and female newly born calves and adult buffaloes at different ages were given. The age of puberty for females born in the farm was calculated from the age of first calving after deduction of 312 days epeicted pregnancy period before and after 1981. Calvings intervals were calculated for certain individuals till the fifth consecutive calvings. The breeding life as correlated to the number of calvings was obtained for elder buffaloes.

Management:

This includes stable, feeding, grazing and breeding.

Stable:

The situation of the stable is suitable for good ventillie on dust or mud and rarely on rice straw. Removal of the manure performed daily at time of grazing.

Feeding:

Concentrate mixture, contains 35% decorticated cotton seed cake, 33% wheat bran, 22% maize, 4% rice polish, 3% molasses, 2% limestone and 1% salts, offered to the animals in the following amounts: Milking Buffalo Cows 6 kg; Pregnant Buffalo Cows 4 kg; Heifers and non-pregnant buffalo cows 3 kg. Wheat straw was added when available from 3 to 5 kg per animals. The concentrate mixture contains: 15% crude protein, 50.1% carbohydrate, 12.2% crude fibres and 4% fat according to MORRISON (1959).

Grazing:

Daily grazing for the buffaloes was advised from 8 a.m. to 13 p.m in Winter and from 7 a.m to 10 or 11 a.m in Summer according to the hotness of the weather. Grazing occurred on Hegazi and or Meskaw barseem most of the year. The animals stayed freely in the sun or under tree shade during the grazing time.
Breeding:

To avoid high Summer mortality of the newly born buffalo calves, natural breeding was allowed during late winter and early Spring to expect calvings at late Autumn and during Winter.

RESULTS

An idea the seasonal variations in air temperatures and humidity of the Egyptian Western Desert can be taken from Table (1). There is no rain in the area and water comes from different wells.

The results of clinical examinations for the two buffaloes bulls in the farm are presented in Table 2, where biometry of the genitalia and semen picture were given.

The propagation of buffalo cows from 1974 to 1983 and some of their reproductive traits and calf mortality are summarized in Table (3). The buffalo cows brought from SACHA (1974) are supposed to be pregnant, therefore the pregnancy rate at that year was high. Rectal examinations were not performed before 1981 and the pregnancy rate during that period was calculated from the records of calvings. The incidence of pregnancy increased from 50.2% to 78.6% after Gynaeological care. Moreover, calf mortality decreased from 19.2% to 1.5% (average values). The ratio between males and females newly born calves was 1:1.02 (total numbers).

Animals died in the farm were reported to be due to the following causes: reaction to cattle plague vaccination (3), enteritis (6), pneumonia (6), traumatic pericarditis (2), uterine torsion (3), typany (1) and peritonitis (1).

The age of puberty and calving intervals showed much improvements after care (Table 4). Among consecutive calvings the first intervals was the shortest (Mean 442 days).

The results of gynaecological examinations (Table 5) showed an incidence of 14.3% ovarian inactivity which responded successfully to dibasic sodium phosphate treatment (80%) than tonoprophosan (57%). Chronic endometritis treated with P N F suspension gave good results (100%).

The milk production and lactation length as calculated before and after gynaecological care (1981) are shown in Table (6). The total milk yield increased gradually till the 4th lactations (1864 kg) while the lactation length reached its maximum average values at the 4th (300 days) and 5th (311 days) lactations. The average milk yield per day and per 305 days increased after care from 5.1 to 5.5 kg and from 1564.6 to 1670.5 kg respectively (total values).

It is of interest to mention that certain individuals reached a maximum value of 14 kg milk per day during the 3rd or 4th lactation season.

As shown from Table (6), the weights of male and female buffalo calves at birth were nearly similar (32.0 and 31.5 kg respectively). At 2, 2.5 and 3 years of age, the calculated gain in body weight of mature buffalo bulls averaged $0.56 \pm 0.07$, $0.45 \pm 0.04$ and $0.34 \pm 0.07$ kg per day respectively. For elder buffalo bulls and cows the live weight reached an average of $620 \pm 36.1$ and $594 \pm 52.7$ kg respectively.

From the records obtained for the first 18 imported buffalo cows in the farm, 13 were discarded at an average age of 7 years 9 months (range from 4 years 3 months to 11 years 2 months). The average number of calvings for these buffaloes was 3.7 with a range from

BREEDING BUFFALOES

2 - 6 calves per animal. The rest 5 buffaloes of this group still alive and pregnant. They varied in age between 10 years 4 month and 13 years 6 months and each one of them gave 6 previous calvings.

DISCUSSION

The breeding of buffaloes in the New Valley desert area of Egypt seems to be the first successful trial in this respect as it was conversely reported by COCKERILL (1974) that buffaloes introduced into countries south of the Sahara in Africa during the past four centuries have invariably succumbed due to disease or mismanagement.

The fertility of buffalo bulls used for natural breeding in this area lies within the scope reported by OSMAN (1965) and WHYTE and MATHUR (1974). Moreover, the breeding life which extended beyond 11 years compared well with the average age of 8.7 years reported by EL-ITRIBY (1974) for Egyptian buffalo bulls.

After gynaecological care the pregnancy rate of the studied buffaloes reached an average of 75.6% which is higher than 29%, 48.8% and 57.6% as reported by SCHMIDT, EL-SAWAF and GHARIB (1963), EL-WISHY (1965) and SHEHATA (1983) respectively. Culling of buffalo cows which were unsuitable for breeding increased the rate of pregnancy to 86.4% during the last year.

The inculsion of calf-mortality decreased from 36% (1980) to 0.7% (1982) after better management and hygienic housing of the farm. ASKER and EL-ITRIBY (1957) reported a mortality rate of 33% from birth up to 3 years of age in buffaloes. SHAHIN, BARRADA and EL-ITRIBY (1967) reported higher figure (70.5%) from birth to 6 months of age. It is important to mention that regulating the time of natural breeding in this farm (March - May) avoid the occurrence of high Summer calf-mortality which was suggested by PAL (1952) to be simply heat stroke.

The age of puberty (mean about 33 months) as calculated from the age of first calving is more than 22.2 months recorded by ZAKI, SOLIMAN and RAMSEES (1963). However, the mean age at first calving which decreased after gynaecological care from 49 to 44 months appeared to be still higher than 38 months reported by ALIM (1957). Through suitable management better improvement could be achieved as certain individuals gave their first calvings at 33 months of age.

The mean calving-interval which decreased from 582 to 472 days seems to be the result of gynaecological care and follow up of the animals. On the other hand, KHISHIN (1951), ALIM and AHMED (1954) and ALIM (1978) reported different calving intervals between 452 and 650 days in buffaloes. Among consecutive calvings, the first calving interval is the shortest and some individuals have 336 days calving interval with a minimum of 23 days for the first fertile postpartum estrus. EL-WISHY (1965) reported a wide range of 30 to 1266 days for the first postpartum conception in Egyptian buffaloes. Moreover, Mostageer, MORSY and SADEK (1981) mentioned that the first calving interval (538.2 days) was longer than any subsequent intervals (419.1 - 430.0 days). To shorten the calving intervals in buffaloes, continuous gynaecological care should be practiced. ASHFAG and MASON (1954) cited that calving interval is almost entirely under the control of management and it could have little or no genetic component.

The reported incidence of ovarian inactivity of the studied farm (14.3%) is lower than 29%, 32% and 21.3% as reported by BAR (1963), LUKTUKE and SHARMA (1978) and FARRAG (1978) respectively. The successful use of PNF and dibasic sodium phosphate for the treatment of repeat breeder and ovarian inactivity is close to the findings of ABDELLAH (1981) and SHEHATA (1983) respectively.

The average milk yield (1534.7 kg) and lactation period (289.4 days) reported for buffalo cows in the New Valley farm appeared less than 2101 kg and 307 days (BEDEIR, 1965), 2217 kg and 325 days (EL-KIMORY, 1966) and 2025 kg and 311 days (ALIM, 1978) and much higher than 1267 kg and 186 days (RAGAB, 1945) and 1200 kg and 217 days (MOSTAGEER et al., 1981).

The first lactation milk yield obtained in this work (1347.7 kg) is very similar to 1362 kg recorded by SIDKY (1951) and both values are higher than 1100 kg (SHAHIEN, BARRADA and EL-ITRIBY, 1966). 990 kg (EL-FOULY and AFIFY, 1977) and 1000 kg (MOSTAGEER et al., 1981).

The milk yield per day (4.8 - 6.4 kg) lies within the scope of other Egyptian investigators. Moreover, the negligible differences between total milk yield and milk yield per 305 days denote that most buffaloes produced milk for about 10 months.

The slight improvement in milk production after 1981 (1564.6 to 1670.5 kg/ 305 days) was accompanied by some decrease in the lactation period (293.9 to 284.9 days). This means that heritability of milk production and lactation period as cited by MASON (1974) should be considered beside management when scheme for increasing breeding efficiency is required in buffaloes. Moreover, SINHA and MINET (1947) and MISRA SENGUPTA and ROY (1963) succeeded to increase the daily milk yield by splashing or showered the buffalo cows twice daily for 5 minutes during Summer.

In the studied farm there are few individuals reached a maximum daily yield of 14 kg with a total milk yield of about 3190 kg and a lactation period of about 290 days. KHAN (1967) reported that where milking is carried out three times a day the daily yield reached 16 kg in a single case from a superior herd of buffalo in Pakistan. The available literature showed no further comparable figures. It seems possible that better improvement in buffalo breeding can be achieved if correct progeny is practiced from similar peculiar individuals.

The mean weight of buffalo calves at birth is nearly similar to those estimated by FAHMY (1972) and less than 39.0 kg reported by EL-KHESHIN (1948) and TANTAwy and AHMED (1955). The difference in mean weight between male and female at birth is less than 2 kg reported by MOSTAGEER et al. (1981).

The daily gain in live weight during the first 2 years of age (0.56 kg/days) is nearly similar to 0.61 kg and 0.5 kg reported by SHUTE (1966) for buffaloes at an average initial weights of 184 kg and for 20 weeks and KASSIR, McFETRIDGE and HENSEN (1969) for buffaloes aged 15 months respectively. BADRELDIN (1955) found that under good condition of feeding the average daily gain reached 0.86 kg in naturally suckled buffalo calves.

The daily gain in live weight of the studied animals which decreased markedly, after 2.5 and 3 years of age (0.45 kg and 0.34 kg respectively) denoted that buffaloes showed better fattening ability during the first two years of their life. Information on weight gain of mature buffaloes is limited in the literature. However, CUMBURIDZE and DALAKISHVILI (1959) and OGNJANOVIĆ (1974) cited that if buffalo calves are well fed and managed they yield a meat which in quantity is not inferior to that of other bovine animals.
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The buffaloes which gave 6 calves and still pregnant in the farm coincide with the report of COCKRILL (1974) that female buffaloes become sterile after 7 - 8 calves at the age of 14 - 16 years. ALIM (1953) and EL-ITRIBY (1974) cited that true figure for the longevity of Egyptian buffaloes on farms do not exist and they assume similar calving numbers under village conditions.

REFERENCES


A.M. OSMAN


BREEDING BUFFALOES

TABLE (1)

Seasonal variations in air temperature and humidity in the New Valley desert area of Egypt.

<table>
<thead>
<tr>
<th>Seasons</th>
<th>Air Temperature °C</th>
<th>Humidity %</th>
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<td>Maximum</td>
<td>Minimum</td>
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<td>(34.8-46.4)</td>
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<td>Autumn</td>
<td>27.8±4.7</td>
<td>10.2±5.6</td>
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<td>(20.5-36.7)</td>
<td>(0.6-20.8)</td>
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<tr>
<td>Winter</td>
<td>21.9±4.2</td>
<td>2.8±3.4</td>
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<td>(14.6-34.7)</td>
<td>(-2.6-14.8)</td>
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Results of the andrological examination and semen picture of the two breeding buffalo bulls in the New Valley Farm

<table>
<thead>
<tr>
<th>Buffalo Bull No</th>
<th>Age (year)</th>
<th>Body weight (kg)</th>
<th>Testes size (cm)</th>
<th>Epididymis size (cm)</th>
<th>Seminal glands size (cm)</th>
<th>Semen picture</th>
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### TABLE 1 (4)

**ARTIFICIAL INSEMINATION**

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**Note:**
- Data as of December 31, 1982.
- Figures represent the number of artificial inseminations performed each month.

**Inference of Table:**
- The table shows the number of artificial inseminations performed each month from 1971 to 1982.
- The data is reported as the total number of inseminations for each month.

**Source:**
- Data compiled by the Farm Extension Service, University of California.
### Table 4

Age of puberty and calving intervals for 6 consecutive calvings of buffaloes in the New Valley farm before and after gynaecological care (1981)

<table>
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<td>341</td>
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<td>Maximum</td>
<td>61</td>
<td>44</td>
<td>862</td>
<td>922</td>
<td>1179</td>
<td>971</td>
<td>766</td>
<td>858</td>
<td>1179</td>
<td>665</td>
</tr>
<tr>
<td>n</td>
<td>18</td>
<td>16</td>
<td>55</td>
<td>29</td>
<td>13</td>
<td>6</td>
<td>4</td>
<td>107</td>
<td>50</td>
<td>35</td>
</tr>
</tbody>
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<th>%</th>
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<th>%</th>
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<td>1.2</td>
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<td>1.7</td>
<td>4</td>
<td>3</td>
<td>4.3</td>
<td>1.4</td>
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Results of an experimental extraction for bullions in the New Valley Farm

(5)

References:

611
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<tr>
<th>Week</th>
<th>Milk Yield</th>
<th>Fat %</th>
<th>Protein %</th>
<th>Udder Condition</th>
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<td>0</td>
<td>657.0</td>
<td>5.0</td>
<td>2.9</td>
<td>Healthy</td>
</tr>
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<td>5.0</td>
<td>2.9</td>
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<tr>
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</tr>
</tbody>
</table>

**TABLE (6)**

A.M. OSMAN

200
**BREEDING BUFFALOES**

**TABLE (7)**

Live body Weight for Buffaloes in the New Valley Farm (Kg)

<table>
<thead>
<tr>
<th>Age</th>
<th>n</th>
<th>Mean ± St. Dev.</th>
<th>Range</th>
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<tr>
<td>Male:</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>At Birth</td>
<td>50</td>
<td>32.0 ± 2.34</td>
<td>28 - 35</td>
</tr>
<tr>
<td>2 years</td>
<td>14</td>
<td>411.5 ± 42.47</td>
<td>370 - 520</td>
</tr>
<tr>
<td>2.5 &quot;</td>
<td>20</td>
<td>422.8 ± 36.66</td>
<td>375 - 485</td>
</tr>
<tr>
<td>3.0 &quot;</td>
<td>17</td>
<td>439.4 ± 35.60</td>
<td>385 - 515</td>
</tr>
<tr>
<td>Elder bulls &gt; 4.5 years</td>
<td>3</td>
<td>620.0 ± 36.1</td>
<td>580 - 650</td>
</tr>
<tr>
<td>Female:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At Birth</td>
<td>72</td>
<td>31.5 ± 3.4</td>
<td>27 - 38</td>
</tr>
<tr>
<td>Elder (non pregnant) cows &gt; 5 years</td>
<td>10</td>
<td>564.3 ± 52.7</td>
<td>450 - 625</td>
</tr>
</tbody>
</table>