Summary

Observations on perinatal mortality in Beef Shorthorn cattle were made on a property at a latitude of 19° 50’ S in north-western Queensland during March 1964. There was a perinatal mortality of 16%, due mainly to accidents at parturition and to excessively high body temperatures associated with the hot environment. It is suggested that neonatal hyperxia might be a major source of reproductive wastage in this region in herds which usually calve during the hotter months of December and January.

I. INTRODUCTION

Mean calf branding percentages (number of calves branded x 100/number of cows mated) in tropical Queensland have been reported by Donaldson (1962) to vary from 78 in the coastal plains to 46 in the Gulf of Carpentaria region; the overall average was 50%. Beattie (1952) reported a range of 30 to 60% in the Gulf country.

Donaldson (1962) considered that these low branding percentages were due mainly to low conception rates; however, information on perinatal mortality is lacking.

This paper reports a preliminary investigation of perinatal mortality in a herd of Beef Shorthorn cattle in the Gulf country of northern Queensland.

II. MATERIALS AND METHODS

The observations were made during the period March 9-20, 1964 on a property located at 19° 50’ S latitude, 90 miles north of Cloncurry in north-western Queensland. Cows of mixed ages were examined per rectum and 97 found to be in late pregnancy were confined to a paddock of 600 acres for the duration of the observations. The animals were in good condition and pastoral conditions were good. Within the paddock were several belts of timber, while in the more open areas, mimosa (Acacia farnesiana) provided some shade.

The observations were made by three to four men walking and riding through the paddock almost continually during the daylight hours. Calves were weighed and eartagged when first found and an attempt was made to record their rectal temperatures, respiratory rates and bodyweights several times daily but the calves could not always be found. Calves which died were submitted to a post-mortem examination.
III. RESULTS AND DISCUSSION

Forty-nine births occurred during the observations. However, only 46 viable calves were produced, the males having a mean birthweight (± S.E.) of 67.4 ± 0.97 lb. (30.6 ± 0.4 kg.) whilst the females had a mean birthweight of 60.6 ± 1.1 lb. (27.5 ± 0.5 kg.).

Of the three non-viable calves, one failed to breathe due, apparently, to the failure of its primiparous mother to remove the amnion from about its head and the other two died during parturition as a result of dystocia.

The only observed causes of neonatal mortality were hyperexia (hyperpyrexia or heat shock) and maternal desertion. Although the observations were undertaken during relatively mild weather, when the mean maximum daily air temperature was 97.4°F (36.3°C) and the mean minimum was 73.1°F (22.8°C), four calves died as a result of hyperexia; when these calves were last seen before death they were extremely distressed, with rectal temperatures ranging from 108.0°F (42.2°C) to 112.0°F (44.4°C), and at post-mortem examination there were no lesions visible such as might indicate death due to infectious causes. One calf was abandoned by its mother at birth and subsequently died from starvation. There was no evidence of perinatal infections. Thus, under favourable climatic conditions, there was a perinatal mortality of 16%.

Rectal temperature and respiration rate of calves rose during the hot daylight hours (P < 0.001) and more so in calves exposed to direct solar radiation than in calves in shade (P < 0.001) (Table 1). Rectal temperatures were also influenced by the age of the calf; temperatures recorded between noon and 4.30 p.m. during the first three days were significantly less (P < 0.001) than those recorded during the next five days of life (Figure 1) and the age at which the rectal temperature first exceeded 107°F (41.7°C) in six calves ranged from three to six days. Thus, the older calves appeared more susceptible to death from hyperexia. This increase in susceptibility during the latter half of the first week

| TABLE 1 |
| Diurnal variations in rectal temperatures and respiratory rates and the effects of solar radiation |

<table>
<thead>
<tr>
<th>Item</th>
<th>Time of day</th>
<th>Shaded</th>
<th>Direct solar radiation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rectal temperature (°C)</td>
<td>6.00 p.m. - 8.00 a.m.</td>
<td>8.00 a.m. - 6.00 p.m.</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>39.20 (44)</td>
<td>40.15 (121)</td>
<td>41.37 (58)</td>
</tr>
<tr>
<td>Standard Error</td>
<td>0.09</td>
<td>0.05</td>
<td>0.07</td>
</tr>
<tr>
<td>Range</td>
<td>38.0-40.4</td>
<td>38.9-41.5</td>
<td>40.5-42.0</td>
</tr>
<tr>
<td>Respiratory rate (per minute)</td>
<td>75.7 (16)</td>
<td>131.3 (74)</td>
<td>186.1 (30)</td>
</tr>
<tr>
<td>Mean</td>
<td>6.0</td>
<td>3.5</td>
<td>5.3</td>
</tr>
<tr>
<td>Standard Error</td>
<td>40-124</td>
<td>56-200</td>
<td>102-240</td>
</tr>
</tbody>
</table>

Figures in parentheses refer to number of measurements in each category.
Number of observations in each age group shown in parentheses

Fig. 1.—The effect of age upon the rectal temperature (± standard deviation) of calves exposed to high ambient temperatures in north-west Queensland.

may be due to intrinsic factors, such as the increase in basal metabolic rate which occurs at the same time (Roy, Huffman and Reineke 1957; Settltemire, Hibbs and Conrad 1964), or to other factors, such as behavioural changes.

Since the majority of calves in this region are born during December and January when climatic conditions are much more severe than in March, it is suggested that hyperexia could be an important cause of the low calf branding percentages in northern Australia.

IV. ACKNOWLEDGMENTS

The authors wish to thank Australian Estates Company Ltd., and in particular Mr. R. Scandrett, for their cooperation in the provision of facilities for this work.

V. REFERENCES


