Preliminary Findings on the General Characteristics of the Oestrous Cycle in Postpartum Ngaoundere Gudali Cows

O. Messine1, J.P.C. Greyling2, L.J.M. Schwalbach2, D.A. Mbah3 & G.S. Bah1

Keywords: Oestrous cycle- Duration of Oestrus- Gudali cattle- Cameroon

Summary
A study was conducted to determine some important oestrous cycle characteristics (length and duration of oestrus) of Ngaoundere Gudali cattle at the Wakwa Agricultural Research Centre, Cameroon. The mean length of the oestrous cycle was 21.8 ± 0.5 d, significantly (P< 0.05) longer during the dry (24.1 ± 0.7 d) compared to the rainy (20.6 ± 0.5 d) season. A seasonal occurrence of oestrus was detected, suggesting that the oestrus in the Ngaoundere Gudali cow is more frequent during the dry season. The oestrous period averaged 9.8 ± 0.6 h, with a range of 5 to 13 h. It was concluded that although the oestrous characteristics of the Ngaoundere Gudali do not seem to differ significantly from what is reported in other zebu breeds, more studies are needed to draw a clearer picture of the oestrous cycle characteristics of the breed.

Introduction
Reports on beef cattle cow-calf operations show that the main reason for low productivity is the poor reproductive performance of females (7, 9). This situation results from a combination of genetic, physiological, management and environmental factors, which affect the female in all the different reproductive stages, including the oestrous cycle (3). Previous reports (2, 13, 14, 18, 20, 27) have shown the duration of the oestrous cycle in African zebu cattle to vary between 16 and 30 days, with an average of 21 days. Other studies have shown the duration of the oestrous cycle to be affected by season (23, 27) and oestrus to be shorter in zebu than in the Bos taurus cattle breeds (11, 18, 23). However, very little is known about these parameters in Ngaoundere Gudali cattle, one of the most popular cattle breeds of the Adamawa Highlands in Cameroon. The few existing reports on reproductive performance of this breed are based either on information from a very limited number of animals or on results from questionnaires (5, 12, 19). No research work has been carried out to-date, aimed at understanding the basic reasons for the breed’s poor reproductive performance, despite its fairly good productive performance. It was thus necessary to establish the reproductive characteristics of the breed and the effects of environmental factors on these parameters, in order to devise management strategies geared at improving its reproductive efficiency. The aim of this study was to characterise the oestrous cycle in postpartum Ngaoundere Gudali cows.

Materials and methods
The study was conducted on the beef herd of the Wakwa Regional Centre of Agricultural Research between November 2001 and May 2002. The Wakwa Research Centre is located on the Adamawa plateau, about 10 km east of Ngaoundere at latitude 7°30’N and longitude 13°30’E. Wakwa is situated at an altitude of approximately 1200 m above sea level. The breed, climatic conditions, soil, vegetation and general management practices have previously been described (1, 10, 16, 17, 21, 22, 26). Forty postpartum Ngaoundere Gudali cows, aged 5 to 8 years were monitored during a 200-day period following parturition (between mid October and end of May). The cows were maintained on natural pastures, with a dry season supplement (cotton seed cake, 200 g/100 kg BW) offered from mid-January to mid-April. Access to water was unrestricted during the day and the animals were housed in a pen at night. Oestrus was checked twice daily (06:00 to 07:00 and 16:00 to 17:00) with the aid of a penis-deviated teaser bull. All behavioural signs of oestrus and the duration thereof were recorded. Onset of oestrus was taken as the first time when the cow allowed the teaser bull to mount her or was mounted by another anoestrous cow, and stood still. Mean duration of oestrous cycle was determined as the number of days elapsing between two consecutive observed episodes of standing oestrus. When a cow first allowed herself to be mounted, she was isolated in a pen with the teaser bull and oestrous behaviour observed for spells of 30 minutes, at hourly intervals, until the cow no more allowed mountings. Duration of oestrous was then calculated as the time elapsed between first and last observed acceptance to be mounted (4).

In addition to the above historical data collected from the artificially inseminated herd at the Wakwa Centre were used to monitor the seasonal occurrence of oestrus. In this herd,
Oestrus was detected twice a day (7:00 to 7:30, and 16:00 to 16:30) and AI practised all year round. Thus, a total of 1504 occurrences of oestrus over a 9 year period (January 1980 to December 1988) were recorded. All data were analysed with the GLM procedures of SAS (25).

Results and discussion

During the experimental period, a total of 81 oestrous cycles were observed in 25 of the 40 postpartum cows monitored, meaning that 37.5% (15/40) of the cows were in anoestrus or did not show oestrus during the 200 d observation period following parturition. Mean recorded oestrous cycle length 21.8 ± 0.5 d, ranging from a minimum of 15 d to a maximum of 35 d. The frequency distribution of the length of the oestrous cycles is shown in figure 1.

Most of the oestrous cycles (67.9%) had a length comprised of between 18 and 22 d, while 18.52% of the cycles lasted between 23 and 28 d. Only 4.9 and 8.6% of the cycles had a length of 15 to 17 and 30 to 35 d, respectively. These results are in agreement with those recorded from zebu breeds in Nigeria (2, 6, 13, 14, 20) and Ethiopia (18). Reports in other tropical areas showed the oestrous cycle length of tropical indigenous cattle breeds to stand between 16 and 30 d (11).

In the present study, it is possible that the occurrence of silent oestruses and oestrus manifested at night might have been missed. The restricted duration of the observation periods, the relatively small number of animals available for the study and the unfavourable time of the year (mostly during dry season) did not allow for the observation of more than two oestrous periods in most of the cows. Dawuda et al. (6) have reported differences in length for the first, second and third oestrous cycles between the silent oestrus and oestrous cows to be not significant. The oestrous cycles were significantly (P< 0.05) longer during the dry season (24.1 ± 0.7 d), compared to the rainy season.
The mean duration of the oestrous cycle in the Ngaoundere Gudali cows was 21.8 d. Season significance affects the length of oestrous cycle and the occurrence of oestrous in Ngaoundere Gudali cows. The cycles tended to be longer during the dry (24.1 d), compared to the rainy season (20.6 d). Most (65.4%) of the cycles detected occurred during the rainy season, with the majority concentrated in the period between July and October. The presence of the Ngaoundere Gudali cows is more prominently expressed during the rainy season - probably due to the beneficial combination of availability of green and nutritious pastures, and of the mild ambient temperature.

During the dry season in the Adamawa Highlands, the poor quality and low quantity of the vegetation limits the reproductive efficiency of Ngaoundere Gudali cows. Lhoste (16) reported losses in bodyweight of up to 20% in lactating Ngaoundere Gudali cows during this period. It could therefore be hypothesised that during the dry season, most cows are in a state of nutritionally-induced anoestrous associated with lactational anoestrous, as a majority of the dams calving during the rainy season are still nursing their calves during the following dry season. The current results agree with those of Rakha and Igboeli (24) who suggested that day length, along with other environmental factors such as temperature, rainfall and nutrition, are of overriding importance in the expression of oestrous. Although these findings are contrary to those of Zakari et al. (27) in Northern Nigeria where oestrous in indigenous cows seems to be manifested more frequently during the hotter months of the year, they confirm reports stating that cows tend to express oestrous more prominently during the cooler hours of the day. The observation periods in this case (06:00-07:00 and 16:00-17:00) are relatively cooler, and it has been shown that tropical breeds tend to show oestrous during the cooler hours of the day (15, 18).

The actual onset and termination of the oestrous period could therefore have been missed and the low observation frequency could partially explain the shorter duration of the oestrous period recorded. As most of these observations were carried out during the rainy season, the effect of season on the duration of oestrous could be determined. Zakari et al. (27) found mounting behaviour to be affected by season - it lasted longer in the rainy (4.7 hours) compared to the dry season (3.9 hours).

Conclusion

The mean length of the oestrous cycle in the Ngaoundere Gudali cows is 21.8 d. Season significance affects the length of oestrous cycle and the occurrence of oestrous in Ngaoundere Gudali cows. The cycles tended to be longer during the dry (24.1 d), compared to the rainy season (20.6 d). Most (65.4%) of the cycles detected occurred during the rainy season, with the majority concentrated in the period between July and October. The presence of oestrous correlates well with the seasonal concentration of births that occurs 9 months later. These results confirm that oestrous manifestation in the Ngaoundere Gudali cows has just begun to grow and does not meet the requirements of births that occur 9 months later. These results confirm that oestrous correlates well with the seasonal concentration of births that occurs 9 months later.

Acknowledgements

The authors wish to thank the General Manager of the Institute of Agricultural Research for Development for allowing that the results of this work be published. The role of P. Milon and Julienne of the French AFVP (Association Française des Volontaires du Progrès) is acknowledged. The help of Mrs J.-M. Kamdoum, J.A. Nguini, J. Mbakwa and E. Ngipndo of the Wakwa Regional Centre is highly appreciated.

Literature