

HORMONAL REGULATION OF THE OESTROUS CYCLE AND PREGNANCY IN ROAN ANTELOPE (*HIPPOTRAGUS EQUINUS*): A STUDY OF ENDOCRINE DYNAMICS

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ABSTRACT

*This research examines post-partum endocrine reaction and reproductive recovery in Roan antelope (*Hippotragus equinus*), with particular attention to the length and determinants of lactational anoestrus over a period of six months. A quantitative observational study analyzed hormonal profiles and reproductive outcomes in 200 post-partum females and found important variability in the restoration of fertility. The results show that 45% of the antelopes had moderate anoestrus (8-12 weeks), 27% had extended anoestrus (>12 weeks), and 28% recovered early (<8 weeks), indicating the involvement of physiological, nutritional, and environmental factors in reproductive recovery. Moreover, 66% reconceived successfully, whereas 21% continued to be in anoestrus and 13% showed irregular estrous cycles, suggesting probable hormonal imbalances, lactation requirements, or environmental stressors on reproductive function. The research points to the intricate interaction of endocrine regulation, maternal status, and environment conditions in the determination of fertility outcomes, as a call to implement specific conservation and reproductive management measures to augment Roan antelope populations under natural and managed conditions.*

Keywords: Roan Antelope (*Hippotragus equinus*), Post-Partum Endocrine Responses, Lactational Anoestrus, Reproductive Recovery, Hormonal Profiling, Fertility Outcomes, Wildlife Conservation, Reproductive Management.

1. INTRODUCTION

The reproductive physiology of Roan antelope (*Hippotragus equinus*) plays an important role in their sustainability as a population, especially where they occur within conservation areas or managed wildlife reserves. One of the most significant reproductive issues to face post-partum females includes lactational anoestrus, where reproductive function is temporarily inactive owing to alterations in hormone production associated with milk secretion. This process is mainly controlled by high levels of prolactin and oxytocin, which have an important role in preventing ovulation while promoting adequate maternal investment for offspring survival. The length of lactational anoestrus is variable and depends on various factors, such as maternal health, nutrition, intensity of lactation, and environmental conditions. The extended duration of absence of estrous cycles can have significant consequences for reproductive fitness, and hence population growth rates and genetic diversity of Roan antelope herds. Elucidation of the involved endocrine mechanisms controlling this post-partum interval is important to evaluate the reproductive resilience of the species and devise strategies for countering expected difficulties arising from postponed fertility return.

This research aims to investigate the post-partum endocrine reactions and reproductive recovery patterns of Roan antelopes with emphasis on lactational anoestrus duration, variability, and determinants. Through the examination of hormonal variations, resumption of the estrous cycle, and environmental factors like maternal body condition, offspring needs, and quality of habitat, this research hopes to reveal the major drivers of post-partum fertility restoration. Knowledge of these reproductive dynamics will help inform more efficient wildlife conservation and management techniques, especially in regions where habitat limitations or environmental stressors could affect breeding success. In addition, knowledge of the interaction between endocrine regulation and reproductive recovery will help to improve captive breeding programs so that conservation efforts will be in concert with the natural reproductive cycles of Roan antelopes. Finally, these results will inform the development of evidence-based conservation policy, promoting the long-term sustainability of Roan antelope populations in both protected and managed environments.

2. LITERATURE REVIEW

Dery (2016) carried out a comprehensive study on feeding behavior of Roan antelopes (*Hippotragus equinus* desmarest, 1804) in the Gbele Resource Reserve, focusing on their food preference, foraging modes, and seasonality in food availability. It determined major vegetation components that comprised the species' staple food and examined how environmental conditions, including rainfall seasonality and habitat structure, affected their feeding behavior. By recognizing the Roan antelope's reliance on particular plants, this study helped augment more extensive conservation,

especially in formulating sound habitat management techniques in protected reserves.

Gonçalves (2021) examined the evolutionary past of the *Hippotragus* genus, combining phylogeographic and genetic information to follow the lineage and pattern of adaptation in African antelope species. Mitochondrial DNA sequences and morphological traits were examined to calculate the genetic divergence within the genus and reveal the evolutionary forces behind the Roan antelope's present distribution. The results indicated that previous climatic changes, including glacial and interglacial times, had been important forces behind genetic differentiation and geographic spread. Through the presentation of a molecular outline of Roan antelope evolution, the study augmented understanding of the genetic diversity, population structure, and adaptive capacities to climatic shifts in the species.

Grant et al. (2002) focused on the conservation issues of rare antelope species with the northern basalt plains of Kruger National Park as a case study. Their study emphasized major threats, such as habitat degradation, competition with other herbivores, predation pressure, and human-induced disturbances like poaching and land-use changes. The study mentioned the decline in Roan antelopes in some areas and stressed the importance of focused conservation efforts. These consisted of habitat recovery, regulated predator control, and anti-poaching programs to minimize the threats encountered by the species. The conclusions presented useful advice to wildlife conservation authorities, especially in the development of long-term approaches to maintaining healthy Roan antelope populations within their native ecosystems.

3. RESEARCH METHODOLOGY

This research employs a quantitative observational method to examine post-partum endocrine reactions and reproductive recovery in 200 Roan antelopes over a period of six months. Data were gathered by direct observation, hormonal profiling, and reproductive evaluation, which were examined with descriptive statistics, percentage distributions, and graphical presentation to detect patterns in lactational anoestrus and fertility outcomes.

3.1 Research Design

This research uses a quantitative research design to examine post-partum endocrine response and reproductive recovery in Roan antelopes (*Hippotragus equinus*). The study takes an observational and analytical research method with a focus on lactational anoestrus incidence and fertility outcome within a six-month post-partum interval. Through classifying reproductive recovery patterns, the research seeks to establish factors contributing to variations in resumption of fertility among the antelopes.

3.2 Data Collection

The research included systematic observation of 200 post-partum Roan antelopes in a controlled setting. Data was collected using direct observation, hormonal profiling, and reproductive cycle measurement at regular intervals. Estrous cycle return, anoestrus period, and reproductive status were measured for every animal. Other factors, including nutritional status, lactation requirements, and environmental conditions, were also taken into account to evaluate their possible effect on reproductive recovery.

3.3 Sample Size

200 post-partum Roan antelopes were chosen for the study. Sampling was aimed at representing and making the study statistically reliable in assessing post-partum reproductive trends. Healthy females that had given birth within a short time were selected based on criteria such that there could be proper determination of lactational anoestrus and fertility recovery.

3.4 Data Analysis

The data gathered were processed using descriptive statistical techniques to establish lactational anoestrus incidence and reproductive recovery trends in post-partum Roan antelopes. Percentage distribution tables (Table 1 and Table 2) were used in the analysis to display reproductive recovery variations and showcase the clear distribution of various recovery periods and fertility status. Also, graphical representations (Figure 1 and Figure 2) were employed to help visually depict the main findings in order to better interpret the results. Comparative analysis of anoestrus length and fertility status was carried out in order to observe patterns and possibly influential factors, including hormonal regulation, lactation requirements, and environmental conditions that impact reproductive recovery.

4. DATA ANALYSIS AND INTERPRETATION

Table 1 shows the frequency distribution of lactational anoestrus duration in 200 post-partum Roan antelopes. The information is divided into three categories according to the duration of reproductive recovery. A large percentage (45%) of the sample had moderate anoestrus (8-12 weeks), which means that almost half of the population took this period to recover and resume estrous cycles. Long anoestrus (>12 weeks) was noted in 27% of the antelopes, indicating reproductive recovery delay owing to prolonged hormonal suppression. In contrast, 28% of the sample showed early

recovery (<8 weeks), reflecting a quicker recovery to fertility.

Table 1: Incidence of Lactational Anoestrus

Category	Number of Antelopes (N=200)	Percentage (%)
Prolonged Anoestrus (>12 weeks)	54	27%
Moderate Anoestrus (8-12 weeks)	90	45%
Early Recovery (<8 weeks)	56	28%

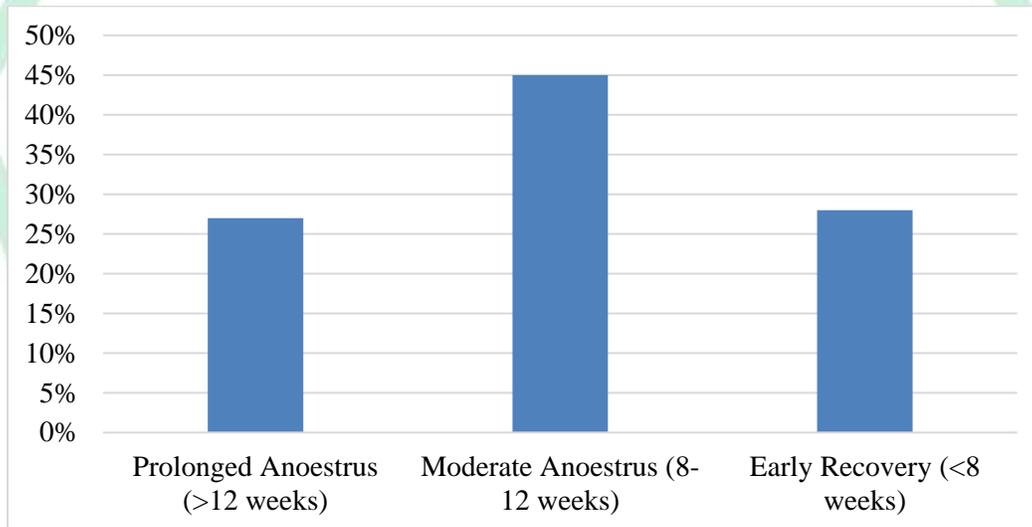


Figure 1: Graphical representation of Incidence of Lactational Anoestrus

Results showed that lactational anoestrus is very diverse among animals, with over a quarter (27%) reporting an extended time out of reproductive action. This may imply that physiological or environmental causes, e.g., diet, lactation need, or hormonal balance, have an impact on recovery. The largest percentage (45%) of the antelopes came into the moderate category of anoestrus (8-12 weeks), as could be predicted following post-partum recovery times. Yet, the 28% of early recovering antelopes point out that certain antelopes recover reproductive function quite soon, perhaps as a result of effective hormonal regulation or beneficial environmental conditions.

Table 2 shows the reproductive recovery of 200 post-partum Roan antelopes over six months. A majority of the sample (66%) reconceived successfully within the period, pointing to high post-partum reproductive potential. 21% of the antelopes, however, were in anoestrus, which represents delayed reproductive recovery and potential underlying physiological or environmental factors. Furthermore, 13% had irregular estrous cycles, which indicate hormonal imbalances or external factors interfering with their reproductive function.

Table 2: Fertility and Reproductive Recovery Outcomes

Reproductive Status at 6 Months	Number of Antelopes (N=200)	Percentage (%)
Successfully Reconceived	132	66%
Still Anoestrus	42	21%
Irregular Estrous Cycles	26	13%

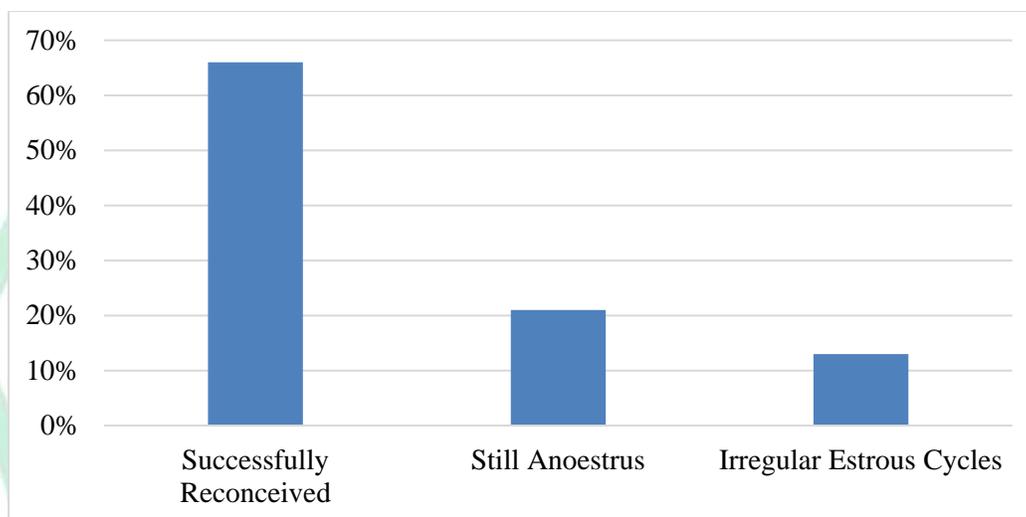


Figure 2: Graphical representation of Fertility and Reproductive Recovery Outcomes

The findings bring out that two-thirds (66%) of the Roan antelopes resumed reproductive activity successfully within six months, validating a fairly effective post-partum return to fertility in most individuals. The 21% remaining in anoestrus, however, suggests causes like prolonged lactational inhibition, dietary insufficiency, or stress that can impede resumption of estrous cycles. The 13% with irregular estrous cycles indicate possible hormonal balance fluctuations, which may be due to environmental factors, lactation requirements, or inherent reproductive health complications.

5. CONCLUSION

The conclusions of this research demonstrate considerable differences in post-partum reproductive recuperation in Roan antelopes, indicating the control of physiological, environmental, and hormonal influences on lactational anoestrus length and fertility status. Although most (66%) were able to reconceive in six months, the considerable 21% were in anoestrus, reflecting delayed reproductive recuperation perhaps as a result of prolonged hormonal repression, milk energy requirements, or insufficient nutrition. Also, 13% showed abnormal estrous cycles, indicating endocrine disturbances or extrinsic stressors influencing fertility. Lactational anoestrus had varying incidences, 45% showing a moderate duration (8-12 weeks), 27% facing prolonged anoestrus (>12 weeks), and 28% recovering early (<8 weeks), reflecting individual variability in reproductive resistance. These results highlight the necessity of more research on maternal health, the environment, and endocrine regulation to maximize reproductive management for Roan antelopes in wildlife management and conservation programs.

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