

Nursing Behavior in Dam-Reared Russian Saiga (*Saiga tatarica tatarica*) at the San Diego Wild Animal Park

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This study was designed to examine the nursing patterns and related behavior of young saiga raised by their dams. Four captive born lambs were observed at weekly intervals during continuous 14 h watches for the first 7 weeks of life. One-week-old lambs were found to nurse at an average rate of 1.1 bouts per hour and nursed for an average of 14.6 seconds per bout. This high nursing frequency and the average total daily nursing time of 242 seconds decreased rapidly with age. Saiga lambs sampled solid food as early as 4 days of age and were nearly dependent on solid food by the age of 7 weeks. Communal nursing, in which one or more lambs would nurse from an unrelated adult female while she nursed her own, was common. Grooming of the lamb by the dam was never seen except immediately following birth. © 1994 Wiley-Liss, Inc.

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INTRODUCTION

The population of Russian saiga *Saiga tatarica tatarica* (Fig. 1) in the wild has recently experienced a great reduction and is threatened with extirpation in much of its natural range due to hunting and habitat encroachment [Teer, 1991]. Propagation of captive herds throughout North America and Europe has become increasingly important because economic and political conditions in Russia have handicapped preservation strategies for the species. Understanding the various aspects of the natural behavior of this species is crucial to the development of a successful husbandry program. Knowledge about the nursing behavior of the dam-reared calf is one such component which can be applied to current husbandry techniques. Although successful hand-rearing of the saiga has been documented [Orbell and Orbell, 1976; Rohrer, 1979] and the biology and behavior of the species has been studied [Bannikov, 1967], there is little information on the nursing behavior of the dam-reared lamb.

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The purpose of this study was to examine this phase of a saiga's life with the intent of incorporating the findings into captive husbandry programs.

METHODS

The San Diego Wild Animal Park, located 11 km east of Escondido, California, currently houses a saiga herd of 11 females and 1 breeding male in a 1,115 m² off-exhibit enclosure. Observations were made on 2 male and 2 female lambs born in the spring of 1991. The selected lambs were born to four different dams; three were twins and one was a single birth. Each lamb was identified by a small unique pattern shaved in its fur. The 6 week study began in May, when the lambs were between 4 and 12 days of age. The herd was observed from outside the enclosure, with the aid of binoculars, at weekly intervals and continuously for 14.3 h between 0515 and 1930 hours per day. Data were collected on duration and frequency of nursing bouts and related behaviors. A nursing bout occurred when the lamb had its muzzle at the dam's udder and its head movement indicated it was suckling. A nursing bout was considered successful if the lamb had contact with the udder for at least 2 seconds. Nursing bout durations were timed with a stopwatch.

RESULTS

Young saiga lambs nurse frequently, and for a very short time at each bout. Nursing bouts were distributed rather evenly throughout the day without any noticeable peaks. The frequency of successful bouts was found to have a significant negative correlation with age (Kendall's Tau = -0.81, $n = 7$, $P = 0.05$). The average number of successful bouts was 16 per 14.3 h (1.1 bouts/h) at 1 week and declined steadily to an average of 3 per 14.3 h (0.21 bouts/h) by the age of 7 weeks (Fig. 2). Average length of nursing bouts varied from 11.4 to 16.1 seconds, with an average of 14.6 seconds, and did not change significantly with age. Total nursing time declined significantly, however, as the lamb matured (Kendall's Tau = -1.0, $n = 7$, $P = 0.05$). The average daily nursing total was 242 seconds at the age of 1 week and declined steadily to 40 seconds by week 7. Lambs nursed from whichever female would allow it. Nursing seemed to be triggered by hearing another lamb or adult vocalizing or by seeing another lamb nurse or attempt to nurse. Nursing "frenzies" often resulted, in which hungry lambs would approach several lactating females before finding a receptive one. On numerous occasions lambs that were not siblings were seen nursing from the same female. Twins nearly always nursed at the same time, and quite often one or more other lambs would squeeze in and nurse also. As many as six lambs were seen attempting to nurse from a female at one time.

Adult females appeared to dictate when and how long the lambs could nurse and invariably terminated the bouts. Aggression by females was never seen; they simply moved away. The percentage of unsuccessful nursing attempts at the age of 1 week changed from 24% (average = 8.5 bouts/day) to a peak of 50% (average = 11.7 bouts/day) at four weeks and then back down to 25% (average = 1 bout/day) at the age of 7 weeks (Fig. 2). Lambs started sampling solid foods between 4 and 10 days of age and were first seen to ruminate at approximately 3 weeks of age.

The adult females were seen grooming their offspring shortly after birth, but never after this.

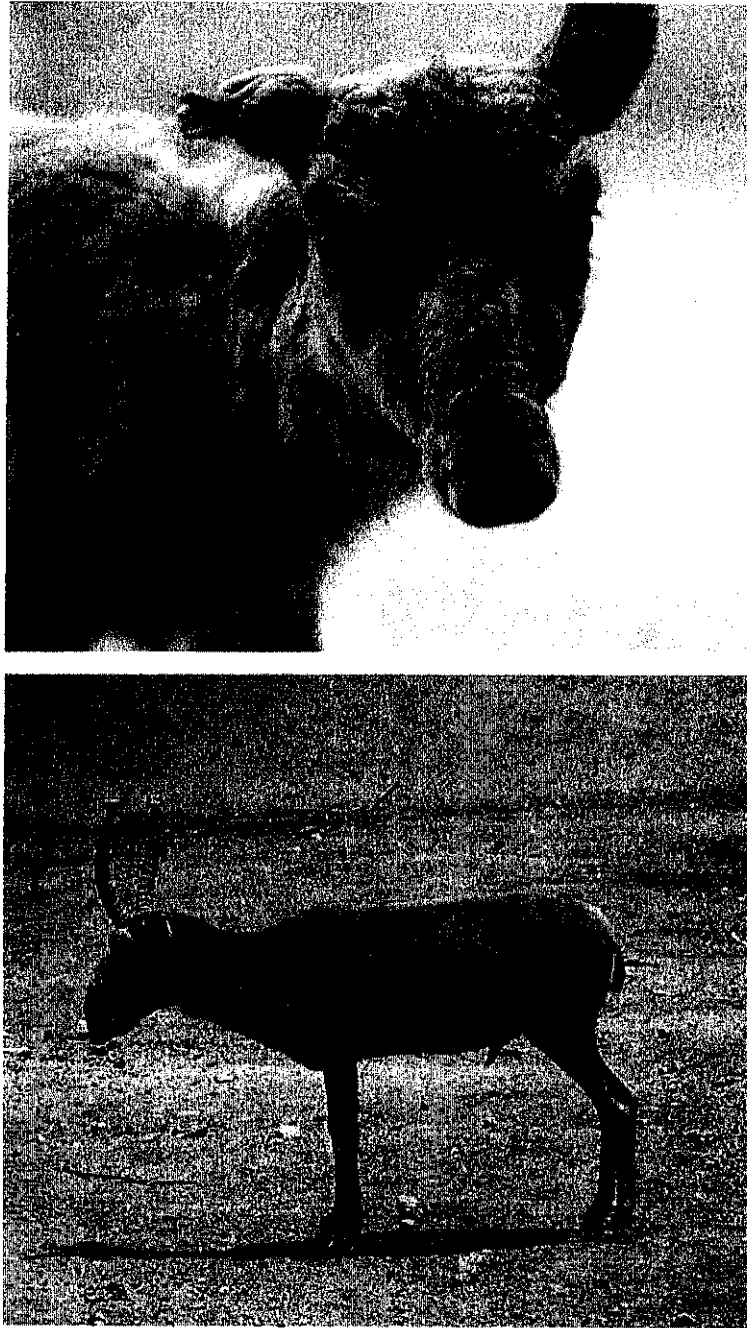


Fig. 1. Russian saiga lamb (top) and adult male (bottom) at the San Diego Wild Animal Park.

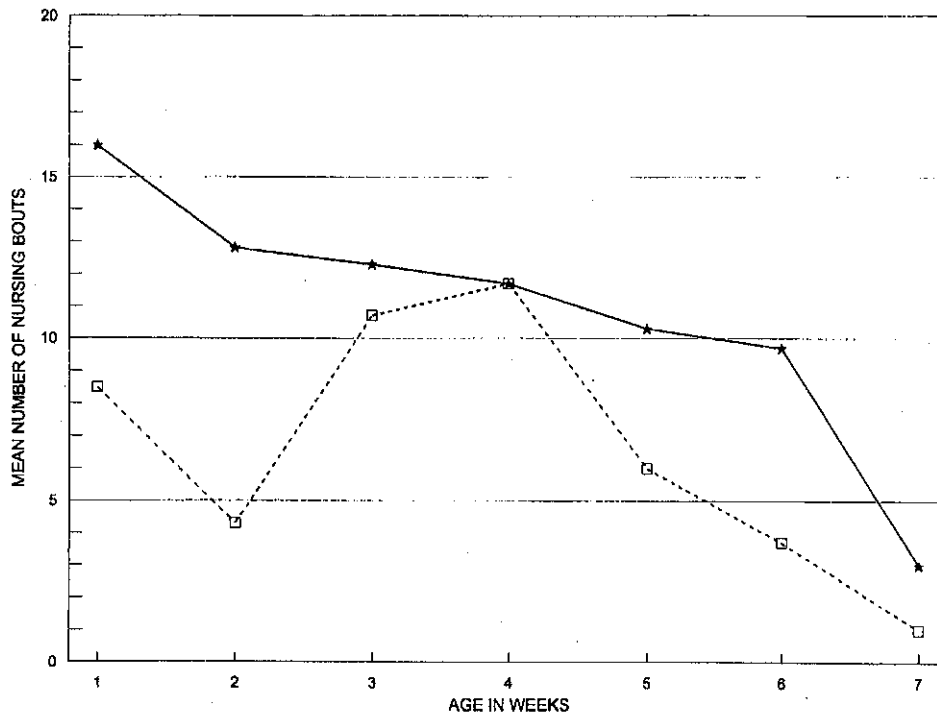


Fig. 2. Average daily nursing bouts of saiga study group. ★ = successful; -□- = unsuccessful.

DISCUSSION

Lambs in this study nursed much more frequently and in shorter bouts than previously reported in wild saiga [Bannikov, 1967]. This reinforced our belief that hand-reared lambs should be fed smaller volumes more frequently. When fed at 3 h intervals, the lambs often appeared hungry between feedings and yet did not always finish their bottles when offered. For this reason, we suggest that lambs be fed at 2 h intervals for the first 1–2 weeks and at 3 h intervals thereafter. The dam-reared lamb was rarely allowed to nurse to satiation. We have found that lambs eat more consistently and have less problems with bloat and/or diarrhea when not allowed to gorge themselves. Orbell and Orbell [1976] also observed that lambs suffered obvious discomfort after being allowed to nurse to satiation in one feeding. Although Dolan [1977] reported that lambs rise mainly to feed in the early morning and evening hours, and Bannikov [1967] stated that wild saiga nurse only three times daily, nursing in our study group was distributed rather evenly throughout the day. We therefore bottle feed hand-raised lambs at equal intervals. The peak in unsuccessful nursing attempts that occurred at 4 weeks of age could be explained by an increase in the lambs' appetites and metabolic needs before they started consuming substantial amounts of solid food. After this age, the nursing attempts declined as the lambs fed more on solid foods. Although we intended to wean hand-raised lambs at 3–4 months of age, many started refusing bottles and weaned themselves as early as 8 weeks. This is consistent with the rapid decline in nursing rates and total daily nursing time seen in

the dam-reared lambs in our study and the weaning ages observed in wild saiga [Bannikov, 1967].

Orbell and Orbell [1976] reported that a hand-raised lamb began eating solid foods at 14 days of age. Lambs in our study and those in the wild [Bannikov, 1967] started as early as 4 days of age. Young hoofstock appear to start sampling solid foods at an earlier age when able to observe older animals feeding [Rubin and Michelson, personal observations]. We suggest that a variety of solid food items be offered to lambs from 2–3 days of age and that they be housed with maturing juvenile ungulates (saiga or other species) when possible. Since rumination was first seen at approximately 3 weeks of age, it can be assumed that this is the age at which rumen function begins.

Young of many species require grooming or anogenital stimulation to induce nursing, urination, or defecation [Spinage, 1986; Rubin and Michelson, personal observations], but this is apparently not true for saiga lambs, as these behaviors were spontaneous and not facilitated through maternal stimulation.

Lambs in this study frequently nursed from females other than their own dams, often alongside the dam's own offspring. This behavior, which was also observed in another captive saiga herd [Ramsay et al., 1992] but not in wild saiga [Bannikov, 1967], could be a consequence of captive settings which force the animals to be in closer proximity and provide adult females with a steady supply of food [Packer et al., 1992]. Since a saiga female can have up to four producing mammary glands [M. Anderson, Pathology Department, Zoological Society of San Diego, personal communication], as many as four lambs could obtain milk at the same time. Under these conditions, it is possible that an orphaned saiga lamb could survive in a herd without human intervention. The resource competition created by communal nursing can also be detrimental to certain impaired individuals or lambs born late in the season [Pohle, 1987].

CONCLUSIONS

1. Lambs exhibited short, more frequent nursing bouts than had previously been reported. Total daily nursing time and number of bouts decreased rapidly with age, while the length of bouts remained fairly constant.

2. Hand-reared lambs may do best when fed frequently during the first few weeks of age and could be expected to wean themselves at 2–2.5 months of age.

3. Communal nursing was a common event. This could provide an option for the orphaned lamb, while potentially creating a hazard for the smaller or physically impaired lamb.

4. The dam terminated the nursing bout in nearly all cases; therefore, hand-reared lambs should not be allowed to nurse to satiation.

5. Lambs started sampling solid food as early as 4 days of age, and rumination was first observed at the age of 3 weeks. Solid food should be offered within the first 2–3 days, and lambs should be housed with other neonates to encourage the sampling of solid foods.

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