

## Differences and similarities in nursing behaviour of hares and rabbits

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Observations of behaviour, frequency and time of nursing in wild rabbits are described and compared with data from hares found in literature. The main differences concern the period during which young rabbits stay in stopped breeding burrows; after emerging rabbit behaviour is very similar to that in hares.

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### 1. Introduction

From several Lagomorph-species it is known that young are nursed once a day for a few minutes: *Sylvilagus aquaticus* (Sorensen et al. 1972), *Lepus americanus* (Rongstad & Tester 1971), *L. timidus* (Dyballa 1978) and *L. europaeus* (Broekhuizen & Maaskamp 1980). Young of hares mostly disperse in their first week, but return to the place of birth each day at dusk for being nursed.

In Lagomorph-species in which the doe litters in specially prepared sheltered nests, time of nursing is determined unilaterally by the doe as long as the young have not emerged. In *S. aquaticus* nursing is observed at dawn as well as at dusk (Sorensen et al. 1972). In the wild rabbit (*Oryctolagus cuniculus*) nursing is mostly observed at the end of the night (Lloyd & McCowan 1968), but also at dusk and even twice a day (Schendel 1964, Tinbergen 1970, Lockley 1973). From *S. squaticus* (Sorensen et al. 1972) as well as from wild rabbits (Lloyd & McCowan 1968, Kraft 1976) it is reported that nursing is continued after the young have emerged from the nest.

As for the wild rabbit information about nursing behaviour during the nest period of the young is heterogenous, and no information was found about the aspects of gathering for nursing after emergence of the young, we collected data about behaviour, frequency and time of nursing in the field.

### 2. Material and methods

Data were collected in a coastal dune area (52°37'N; 4°38'E). In May 1979 near three breeding burrows a recorder was placed the pen of which was connected to a cord which crossed the burrows, conform Lloyd & McCowan (1968). In passing the burrow for

nursing, the doe was expected to raise the cord and by that to move the recorder pen.

In the morning of April 5, 1981, an open breeding burrow with new-born young was found on a parking place. Two days later the entrance was found freshly stopped, as in the next mornings when inspected. On April 13, a TV-camera was placed near the breeding stop, initially provided with normal spotlights. Since the doe did not visit the burrow that night, these lights were replaced by infra red spotlights, after which successful observations were made twice a week. Becoming aware of changes in behaviour, from the 18th day of the young's life we observed each night until nursing stopped. At daytime a little pebble was put on the entrance to be sure that the burrow was not opened during the day, when no observations were made.

In the evening of June 20, 1981, four young rabbits, estimated to be about 7 weeks old, were observed in the headlights of a car, being nursed on the verge of the road. Nursing was subsequently observed on July 10, 15, 22, 23 and 24, from a car using infra red binoculars.

### 3. Results

#### 3.1. Recorder registrations May 1979

Most passages through the burrows are recorded to be early in the morning (Fig. 1). Exceptions are the lasts of a series. Of the first series the burrow was found open and empty three days after the last recording, of the second series two days after the last recording.

#### 3.2. TV-observations April-May on breeding stop

Characteristic behavioural aspects related to the young's age are summarized as follows (nights of life are numbered):

3. Burrow visited and stopped, likely early in the morning.

10. Observed with normal spotlights. Stopped burrow not visited.

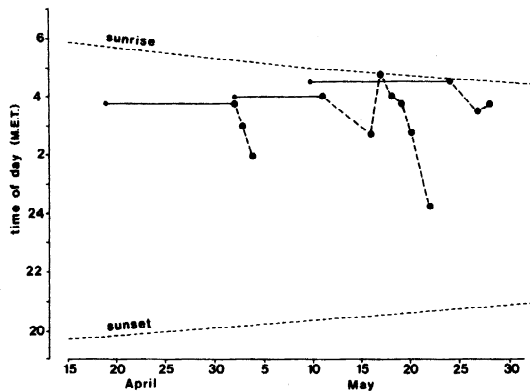


Fig. 1. Times of registered passages in three breeding burrows (dots). Small dots indicate the approximate day of the young's birth.

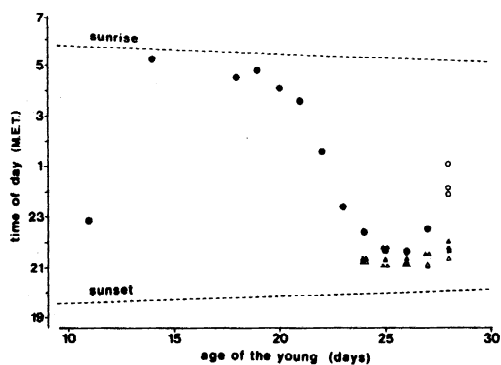


Fig. 2. Times of nursing of young rabbits, collected by TV-observation (dots). Triangles indicate times of arrival of young, the open circles indicate the doe's visits to the vacated burrow the last night of observation.

11: Observations with infra red spotlights. The doe stayed 3 min. underground. After grooming the doe returned and closed the burrow in 4 min., strongly tamping the stop with the fore feet.

14: After opening the stop, the doe nursed overground, standing in a spread posture over the burrow. Little tamping when closing the burrow some minutes after nursing was ended.

18—21: After opening the young came gradually higher in the burrow entrance, and were seen laying on their back whilst suckling. The burrow was stopped without or with little tamping.

22: Before sunset the young opened the burrow themselves. No digging by the doe. After nursing the entrance was not stopped.

23: Six young explored the surroundings before and after nursing. Four of them left the burrow before dawn, two stayed the next day.

24: After dusk all young gathered in the burrow

entrance. When nursing was ended, they all dispersed within a few minutes.

25: Many disturbances by car parkers. Two young showed up after the doe had nursed the others, and were not seen nursed that night.

26—27: Only four young gathered for nursing.

28: Many disturbances. The doe took flight several times. When at last the doe showed up, the young had already left.

29: Many disturbances. No young were seen. The doe did not visit the vacated breeding burrow. The observations were ended.

The observation times of gathering and nursing are shown in Fig. 2.

### 3.3. Observation of nursing along a road June—July 1981

The results of the observations are summarized in Table 1. On July 15, when the young were gathered and waited for nursing, two adult rabbits and a sub-adult one passed and were encountered by the young, likely for nursing. It was evident that the young in their approach did not discriminate between those rabbits and their own mother.

Table 1. Observation times of arrival of the first young and start of nursing in a litter of about 7 weeks old.

	June 30	July 10	15	22	23	24
Arrival of first young			22.25	22.48	22.25	
Start of nursing	23.20	22.12	23.14	23.14	23.14	23.02

## 4. Discussion

The recordings and observations of visits of closed breeding burrows confirm the literature in which nursing in rabbits is mostly reported from the end of the night. However, our observations of nursing of emerged young were all made in the evening, just as happened in hares, and it is likely that synchronization of gathering can be stricter in the evening than at the end of the night.

In emerged young rabbits as well as in young hares the meeting with the doe seems to be just the result of being on the same place at the same time, and no individual recognition seems to be involved (cf. Broekhuizen & Maaskamp 1980). Because in rabbits as well as in several *Lepus*-species the place of littering is also the place for nursing, it is likely that this holds for all Lagomorph-species. In Rabbits it means that also after emerging of the young the breeding burrow keeps an important function in the period between pure milk feeding of the young and pure herbage feeding.

From our observations it became clear that young rabbits born in a breeding stop are nursed only once a day, as in hares. Whether this also holds for rabbits littered in main warrens is unknown and has to be proved.

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