

APPETITIVE BEHAVIOUR OF SHEEP DURING LAMB REARING

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Abstract

Sheep are herd animals with very strong social bonds. Their caring behaviour is expressed not only through the maternal instinct towards lambs, but can also be observed in the feeding behaviour of ewes during the lamb-rearing period. The aim of the study was to analyse appetitive behaviour in sheep during the first 14 days of lamb rearing. The study was conducted on 20 Polish Mountain Sheep ewes. On the first day after lambing, 24-hour observations of ewes and lambs (20 ewes and 20 lambs) were initiated. Observations were carried out using cameras installed in the sheepfold and a digital time-lapse recorder (BCS). The observations made it possible to characterize maternal behaviour during the first 14 days of lactation and showed that, during this period, ewes devoted a considerable amount of time to feed intake and rumination.

Keywords: sheep, ethology, feed intake

Introduction

As ruminants, sheep devote a large part of the day to feed intake and rumination. This is facilitated by the approximately 25-litre capacity of the stomach, which consists of four compartments: the rumen, reticulum, omasum and the true stomach, i.e. the abomasum. A characteristic feature of sheep as ruminants is the length of the intestines, which is approximately 30 times the body length. After ingestion, feed passes into the rumen, where it is broken down by protozoa and bacteria (*Bacteroides*). In ruminants, feed is periodically regurgitated into the mouth and chewed again. Partly digested feed, together with protozoa and bacteria, passes into the abomasum, where final digestion takes place (Clarke, 2001; Hassanin and Douzery, 2003). As herd animals, sheep display a social instinct that enables them to form close bonds with related members of the flock and to observe one another (Landsberg and Denenberg, 2014). These animals remain in groups (flocks) throughout their lives, follow the flock leader, and follow individuals they know and trust (Goodling, 2018). Ewes modify their social behaviour depending on physiological stage (reproduction, offspring rearing, lactation, grazing) (Hinch and Brien, 2014).

Lactation in sheep, and particularly the lamb-rearing period, is a demanding stage for the ewe. During this time, mothers must receive good-quality feed to meet both maintenance and production requirements. In the first days after lambing, ewes spend more time with their lambs, and inactivity (lying close to the lambs) is an important form of rest (Le Pendu et al., 1996; Morgan, 1974).

Appetitive behaviour is a component of instinctive behaviour and consists of two phases: appetitive behaviour itself and the consummatory act. An example of an abnormal consummatory response is wool biting. This phenomenon is common when sheep are kept indoors,

without access to outdoor runs or pasture. Studies have shown that the form in which feed is offered may reduce abnormal behaviour in sheep: wool-biting frequency was higher in animals fed baled feed than in those offered feed in cubes or rolls. Sheep performing movements similar to their natural grazing behaviour may suppress wool biting, as observed when hay is offered in rolls or cubes (Huang and Takeda, 2017). The type of outdoor area and ambient temperature also affect the intensity of feed intake (Bojkovski et al., 2014). During heavy rainfall, sheep also reduce feed intake and activity and seek shelter (Champion et al., 1994).

The offspring-rearing period is a special time for lactating mothers, which display a strong maternal instinct. Their physiological functioning is therefore determined not only by their own needs, but above all by the needs of their offspring. The aim of the present study was to determine appetitive behaviour in sheep during the first 14 days of lactation.

Material and methods

The study was conducted at the Experimental Station of the Department of Animal Nutrition, Biotechnology and Fisheries in Bielany. Twenty Polish Mountain Sheep ewes aged 4–5 years and weighing 45 ± 5 kg were used. The ewes were mated between 15 and 30 October, and lambing took place in the second half of March.

The ewes included in the study reared single lambs, and the lamb group consisted of both ram and ewe lambs. From the fourth month of pregnancy until the end of the observation period, the ewes were kept together as one group in the sheepfold. No other sheep were housed there during this period so as not to disturb the ewe–offspring relationship. From lambing onwards, the lambs remained continuously with their mothers and natural rearing was not disturbed. To ensure correct identification of ewes and lambs during observations, temporary marking commonly used in sheep husbandry at lambing was applied. During the experiment, the sheep were fed according to a traditional system in accordance with the principles and standards developed by the National Research Institute of Animal Production (1993). The ewes received hay, haylage and concentrate feed. On day 1 after lambing, 24-hour observations of ewes and lambs (20 ewes and 20 lambs) were initiated using cameras installed in the sheepfold and connected to a digital time-lapse recorder (BCS). Maternal behaviour was recorded from the first day after lambing until the lambs reached 14 days of age. After the experiment, the recordings were reviewed and the mothers' behaviour was analysed. Feeding-behaviour observations included: feed-intake time (night/day), rumination time (night/day), activity time (night/day), and resting time (night/day).

Results

During the first week after lambing, at night the mothers spent the greatest proportion of time resting (lying, no movement: 43.40%). During the same period, maternal activity (i.e. standing up and nursing lambs) accounted for 24.30%. At night, mothers spent 17.10% of their time on feed intake and 15.20% on rumination, together accounting for 32.30% of the time devoted to appetitive behaviour. During the daytime in the first seven days of lactation, sheep spent the greatest proportion of time on feed intake (35.70%) and rumination (18.10%) in order to meet their own nutritional requirements and those of their offspring. During the day, sheep spent considerably less time resting (22.10%), while activity accounted for 24.20%, a value similar to that recorded at night (Figures 1a, b).

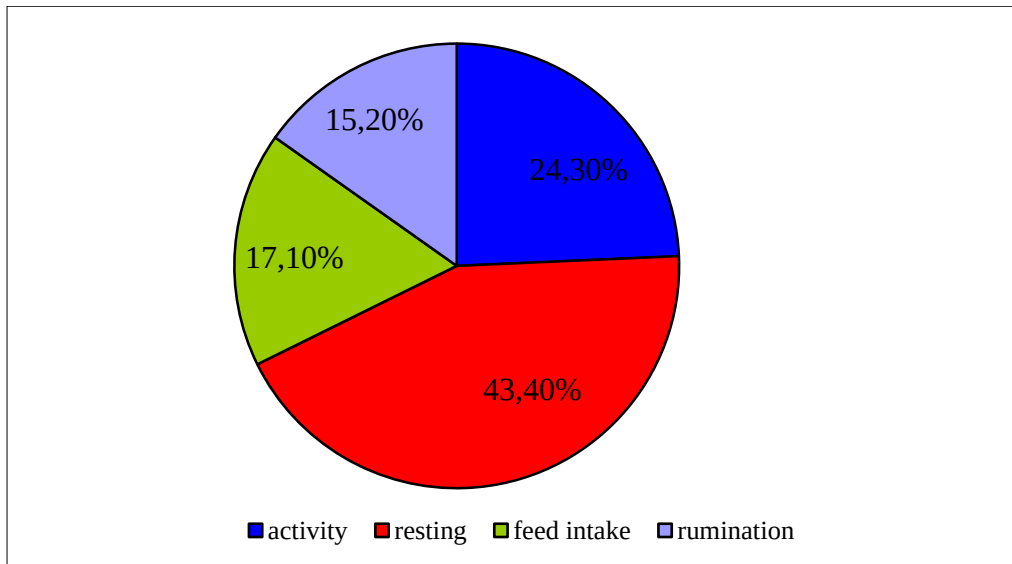


Figure 1a. Appetitive behaviour of mothers in the first week after lambing during the night period

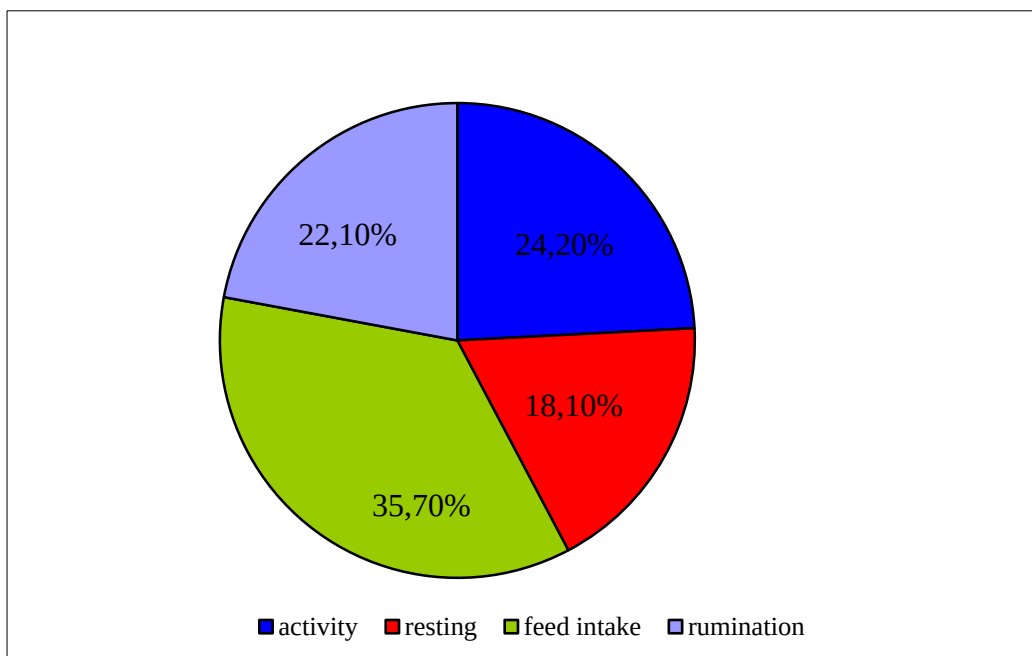


Figure 1b. Appetitive behaviour of sheep in the first week after lambing during the day period

During the second week of lamb rearing, at night the sheep, as in the first seven days of lactation, spent the greatest proportion of time resting (34.80%). Activity accounted for 24.10%. During the second week of lactation, at night mothers spent 24.20% of their time on feed intake, while rumination accounted for 17.00%. During the daytime, mothers spent the greatest proportion of time on feed intake and rumination (35.00% and 19.10%, respectively). Maternal activity also increased (26.90%), while resting accounted for 18.90% (Figures 2a, b).

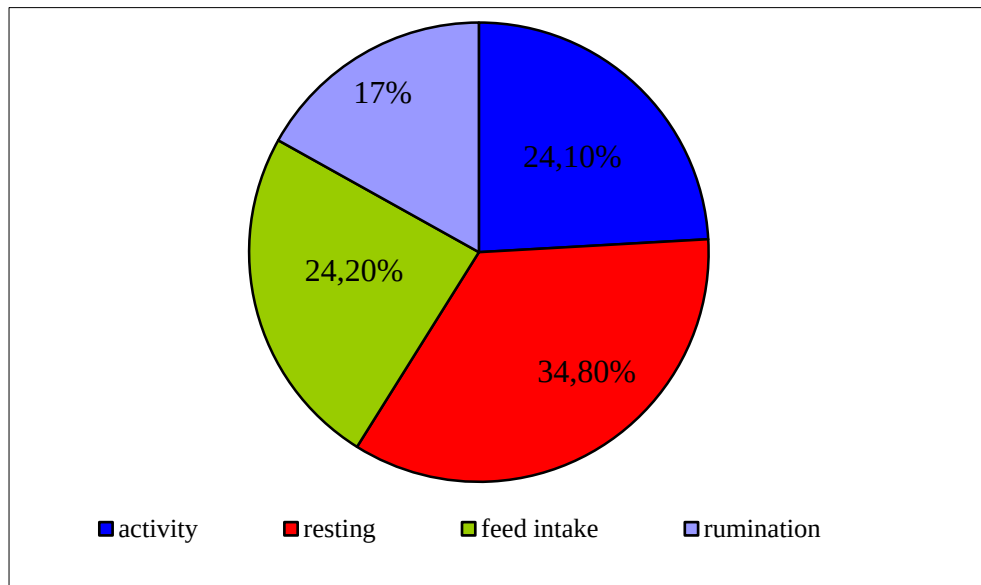


Figure 2a. Appetitive behaviour of mothers in the second week after lambing during the night period

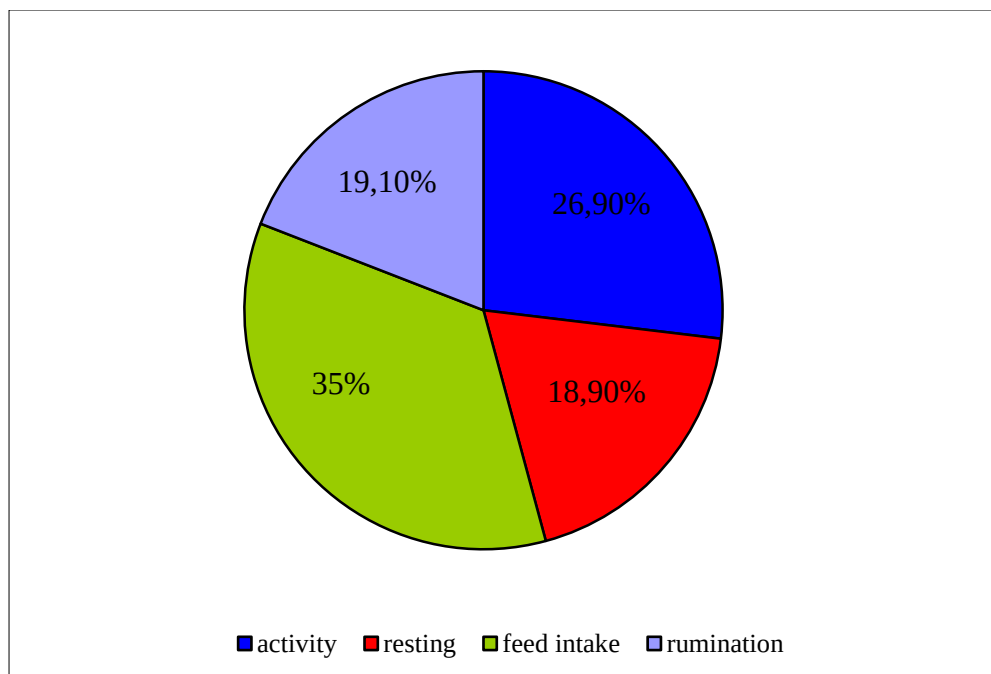


Figure 2b. Appetitive behaviour of mothers in the second week after lambing during the day period

Discussion

Lamb rearing and lactation are physiologically demanding periods for sheep. During this time, mothers must be provided with adequate nutrition. Ewes change their behaviour after parturition as a consequence of maternal-instinct mechanisms (Hinch and Brien, 2014). The results obtained showed that, during both the first and second weeks of lamb rearing, sheep spent the greatest proportion of daytime on feed intake. Feed intake, rumination and activity were more pronounced during the day, whereas at night the animals rested. As lactation progressed and the nutritional requirements of the lambs increased, mothers spent more time on feed intake during the second week of lamb rearing. Studies conducted over the years indicate that the intensity of feed intake in sheep depends on many factors, including the housing system, type of outdoor area and climatic conditions (Huang and Takeda, 2017; Bojkovski et al., 2014; Champion et al., 1994). An open system, a varied outdoor environment and suitable weather conditions positively influence sheep behaviour. The lamb-rearing period is the most important time for establishing the maternal bond and for recognizing and accepting offspring. A lamb learns to recognize its mother within 3–6 days (Désiré et al., 2002). The rearing period is also very important for lambs because they learn, among other things, how to select and consume feed. This learning occurs through observation of adult sheep and, in addition to innate taste preferences, enables lambs to learn which feeds to consume and which to avoid (Provenza et al., 1992). Thorhallsdottir et al. (1990) showed that, when lambs were offered a choice of feeds, they consumed considerably more of the feed preferred by their mothers. Moreover, this relationship applied specifically to lambs and their own mothers: lambs did not imitate the taste preferences of other adult sheep to the same extent. Proper maternal care is crucial not only for lamb survival but also for their later breeding-value traits.

Summary and conclusions

During lamb rearing, an important aspect of sheep management is to provide appropriate housing and feeding conditions. Appetitive behaviour affects maternal productivity and lamb-rearing parameters. During the first 14 days of lactation, mothers spent most of their time feeding and ruminating. The functioning of lactating mothers is determined not only by their own physiological needs, but primarily by the needs of their offspring. Lactation in sheep, and particularly the lamb-rearing period, is a demanding stage for the organism. During this time, mothers must receive good-quality feed to meet maintenance and production requirements. Providing appropriate animal-welfare conditions has a positive effect on offspring development and on the physiological and psychological health of the ewes. In breeding practice, this contributes to optimizing animal production in accordance with the principles of sustainable development.

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SUMMARY

Sheep are herd animals with very strong social bonds. The caring behaviour of sheep applies not only to the maternal instinct – it is noticeable when they eat food during the lamb rearing period. The aim of the study was to analyse the appetitive behaviour of sheep during the first 14 days of lamb rearing. The research was carried out on 20 Polish Mountain Sheep. On the first day after lambing, 24-hour observations of mothers and lambs were undertaken (20 mothers and 20 lambs). Observations were carried out using cameras placed in the sheepfold and a digital time-lapse recorder (BCS). The observations made it possible to learn about the behaviour of the mothers in the first 14 days of lactation and showed that the ewes spend a lot of time in this period on food intake and rumination.

Keywords: sheep, ethology, food intake