

Effects of positive and negative experiences with humans on fear responses in sheep

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Background and aims

Fear is an adaptive emotional reaction that serves to protect animals from danger. However, fear is an aversive subjective state, and chronic or excessive fear may be associated with the activation of the hypothalamic-pituitary-adrenal axis, reducing productivity and compromising animal welfare.

Exaggerated fear of humans can result in unpredictable and violent reactions, putting the stockperson and the animal in danger of injuries. Improving the relationship between sheep and their handler would therefore improve the welfare of both parties. In order to set up strategies to reduce fear, indicators of this negative affective state must be measurable using reliable and valid methodology.

We hypothesized that fear responses can be decreased through positive interactions and increased with negative interactions with human handlers.

We measured the impact of positive, neutral and negative human-animal interactions on behavioural indicators of fear in sheep. From an applied perspective this experiment was meant to model farms on which the stockperson had rewarding, quiet, calm and predictable contact with the animals in the positive treatment group, minimal contact with the animals in the neutral treatment group, and noisy, excited and unpredictable contact with the animals in the negative treatment group.

Material and Methods

A total of 36 Dala breed sheep, ranging from 1 to 5 years old, and their progeny were studied in this experiment. The ewes were scanned by ultrasound and only ewes that were expected to give birth to twins were included in the experiment (progeny N=72). The experimental animals were subjected to positive, neutral or negative interactions with humans during a short intervention, post parturition. Fear responses were tested in an arena 3 weeks after parturition.

The experimental animals belonged to the same flock of 141 animals and were distributed over three treatments of 12 sheep each in three different home tents. The treatments were balanced according to the sheep age and date of parturition. Feeding and care for all treatments were performed by the stockpersons who were familiar to the animals, involving minimal contact between humans and animals. The animals had *ad libitum* access to water and received silage and concentrate twice daily. Dry straw bed was provided to all animals. The stockperson and veterinarians used blue clothes and the experimenters used yellow clothes.

The treatments imposed on the ewes started 2 hours after parturition and were extended over a period of six hours with 10 minutes of exposure every hour. To reinforce the treatment the animals received 10 minutes of treatment per day from day 8 to day 13 after parturition.

For the positive treatment group the experimenter offered concentrate by hand, talked with the animals with a quite voice and moved in a slow and predictable manner. During the neutral treatment the experimenter remained quiet and immobile with arms and hands in contact with the body and facing away from the animals, avoiding tactile or vocal contact. The negative treatment consisted of noisy and unpredictable movements around the animal, in this treatment the experimenter used loud voice, fast and unexpected movements, shouted intermittently and kicked the walls of the pen.

The fear tests were carried out 3 weeks post-partum in an arena test of 4x6 meters to measure the animals' avoidance of a familiar, the one who delivered the treatment, and a less familiar human. The test arena was visually isolated and located in a separated tent.

The animals to be tested were calmly moved from the home tent to the test arena, entered in one end of the arena and the familiar or less familiar human was present in the opposite side of the arena. The human remained sitting and immobile during the test, facing an imaginary point in the arena. The animals were subjected to two tests (familiar and less familiar human) that were balanced across treatments. The ewes were tested together with their respective lambs.

Each test was carried out for five minutes from the moment that the animal entered in the arena. The animals' behaviour was recorded using the MSH Video Program (Video Monitoring System). Behaviour was scored from film using The Observer program (Noldus Information Technology). The duration of time spent in contact with and in proximity (<2m) to the human was measured, as well as the latency for these behaviours to occur from the time when the animal was left alone in the arena and the duration of time spent standing.

Results

Behavioural responses to the familiar human (experimenter)

The duration of time spent in contact with the familiar human and the latency to contact ($P \leq 0.03$) were affected by the treatments. Ewes that had positive experience with the human had a lower latency to contact the human during the test situation and spent a greater percentage of time in contact with the human comparing to the negatively treated ewes. The duration of time spent in proximity to the stimuli ($P \leq 0.20$), the latency to enter this zone ($P \leq 0.12$) and the duration of time spent standing ($P \leq 0.43$) were not affected by the treatments.

Behavioural responses to the less familiar human

The duration of time spent in contact with the less familiar human ($P \leq 0.64$), the latency to contact the less familiar human ($P \leq 0.12$), the duration of time spent in proximity to the stimuli ($P \leq 0.35$) and the duration of time spent standing ($P \leq 0.81$) were not affected by the treatment.

Conclusion

The results reported in this study suggest that ewes treated positively were less fearful to a familiar human when compared to ewes treated negatively. It indicates the importance of positive interactions between human and animal to reduce fear responses in ewes. The animals from the three treatments demonstrated similar responses to a less familiar human, suggesting that the person who did not interact with the animals had no effect in the fear responses.

