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## Sensory factors involved in mother-young bonding in sheep: a review

Mora-Medina P, Orihuela-Trujillo A, Arch-Tirado E, Roldan-Santiago P, Terrazas A, Mota-Rojas D

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The aim of this review is to discuss sensory recognition (olfaction, vision, vocalisation, hearing and direct contact) in relation to the ewe-lamb bond, and the relevance of this information for animal management, considering that sensory recognition between ewes and their offspring is a key element of lamb welfare. In some parental care strategies, parents promote recognition of their own young in order to ensure their survival by providing them – and only them – with food, while the young simultaneously learn features of the environment. In the specific case of sheep, mother-young bonding is established during the sensitive period of the first 4 h after birth. The ewe prints a distinctive signal on her lambs that marks her as the legitimate mother, while stimulating the offspring's learning processes through olfactory, visual and acoustic cues. However, the sensory basis for proximal recognition of lambs changes over time as they learn to recognise the signals emitted by the mother. After 4 h – or less – the ewe becomes maternally selective; this means that she accepts only her own lambs at the udder, while actively rejecting alien newborns. Likewise, newborn lambs develop a preference for their mothers in less than one day. This preference is regulated by the difference between the acceptance behaviour manifested by the lamb's own mother and the aggressive rejecting behaviour shown by alien ewes. This early discriminative ability allows the lamb to avoid the aggressive actions of alien dams and maintain close contact with its own lactating mother. At around one week of age, lambs learn to develop the sensory cues that allow them to recognize their mother. These include olfactory, visual, acoustic and tactile information. Mutual ewe-lamb recognition at an early age also ensures that newborns will be fed and cared for by their own mother, which satisfies some of the requirements for their survival and welfare. For all these reasons, any disruption of ewe-lamb bonding during parturition is detrimental to lamb welfare and survival.

**Keywords:**

ewe-lamb bond; welfare; recognition; olfactory; vocalisation; vision

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