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Impact of maternal stress and nutrition on behavioural and physiological outcomes in young lambs

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Abstract

*The pre-natal period is of critical importance in defining how individuals respond to their environment throughout life. Stress experienced by pregnant females has detrimental effects on offspring behaviour, health and productivity. The sheep (*Ovis aries*) has been used as a model to inform human studies; however, in a farming context, the consequences for the lamb of stress experienced by the ewe have received less attention. The stressors that pregnant ewes are most frequently exposed to include sub-optimal nutrition and acute and chronic stressors related to husbandry and the environment. This review focuses upon the young sheep, from around 100 days old until adulthood and uses material identified from a systematic survey of the literature relating to production-relevant maternal stressors and lamb outcomes. Overall, the results demonstrated that stressors imposed upon the ewe altered progeny behavioural and physiological responses. However, detailed analysis of the literature shows several deficiencies in the field, as a whole, which greatly limit the ability to draw conclusions as to how welfare may be affected by pre-natal challenges in commercial sheep. These deficiencies included a lack of consistency in response due to the variety of both stressors imposed and responses measured. Key gaps in knowledge include the impact of ewe disease during pregnancy on outcomes for their progeny and more generally how different commercially relevant stressors interact. Furthermore, there is a need to develop a systematic series of behavioural and physiological measures that can be integrated to provide a holistic and practically applicable picture of offspring welfare.*

Keywords: *animal welfare, gestation, practical application, offspring response, sheep, stress*