Breeding to improve lamb survival and maternal efficiency in meat sheep

Authors: Joanne Conington[1], Ann Mclaren[1], Maxime Ben Braeik[3], Jean-Michel Astruc[4], Noirin McHugh[2]

[1]SRUC, UK, [2]Teagasc, Ireland, [3]INRAE, France, [4]IDELE, France

It is possible to use information from adult ewes about their reproductive performance to determine the survival of their offspring. Key metrics can be used such as the number of lambs being carried (as determined by ultrasonography), number of lambs born, reared and lost to a given point in time (e.g. weaning). Typically, the non-genetic influences for these traits (e.g. feeding, management etc) largely determine their outcome as the genetic component to most of these traits is relatively low (<10%). These traits expressed by ewes are indicative of maternal efficiency affecting ewe productive longevity and flock profitability. There is also a 'direct lamb' component to lamb survival which are the lambs' own genes impacting on whether or not they survive in-utero development, the neonatal and the lamb growth periods. Also, research undertaken in the SMARTER project in the Manech Tête Rousse breed used a novel method to detect 'lethal' mutations carried by lambs affecting their survival. For example, loss-of-function in gene mutation 'CCDC65' leads to respiratory distress and lamb mortality before weaning, the MMUT gene leads to metabolic default and lamb mortality in the first 24H after birth and SLC33A1 leading to embryonic loss, also contributing to lamb mortality in the first 5 days after birth. Screening animals for these genes will lead to a reduction in lamb losses and requires validation for other breeds.