

Molecular and immunological characterisation of the biofactors in colostrum from two divergent cow breeds (dairy and beef) (RMIS 6569).

Nutritional and immunological (Ig) benefits of colostrum are well known. However, the role of colostrum in delivery of bioactive factors other than immunoglobulins is not defined. Few reports have been published on the molecular component including transcriptome, proteome, small RNA and IgG bioactivity of colostrum and their profiles defined by the cows' environment, and information is limited on the time-dependent expression pattern after parturition. Breeding for enhanced health, in combination with optimised husbandry management, is one approach that will help the Irish dairy and beef sectors ensure that animal products of consistently high quality are available. This project will i), characterise the transcriptome, proteome, miRNA and immunological biofactors in colostrum from primi-parous and multi-parous divergent cow breeds (dairy (Holstein-Friesian) and beef (Limousin) cows). Colostrum samples will be collected immediately post birth (0 hour (h)), and on days 2, 3 and 4 relative to birth. At each sampling time point, colostrum collected will be analysed using the latest approaches including RNAseq (transcriptomics and small RNA), iTRAQ-SCX-LC-MS/MS (proteomics), and further sub-samples will be analysed for IgG concentrations (ELISA), composition and glycan glycosylation and fucosylation; ii) evaluate the effect of colostrum storage on the molecular and biofactor components: by cooling at 4°C (for 6, 12, 24, and 48 h), and by freezing at -20°C or -80°C for periods of 6 and 12 months. This project will deliver new information on colostrum biofactors in terms of cow breed (dairy versus beef), timing of colostrum collection, and storage conditions. This project will complement the DAFM Stimulus project (11/S/131) focusing on "the Predisposing factors for disease and immunocompetence in artificially-reared dairy and suckled beef calves from birth to weaning".

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