

Boosting the Dairy Industry

The end users of our research

Fertility of dairy cows was in decline for 40 years and threatened sustainability of the dairy industry worldwide. Research led by Nottingham University identified key drivers of fertility and provided genetic and nutritional tools to help combat the decline. The genetic tool was the UK Fertility Index, which is used universally by breeders for national and international bull selection. The nutritional tool was the concept that nutritional manipulation of insulin enhances fertility, which is applied by international feed companies and nutritionists. Evidence shows that since release of these tools, the decline has reversed and fertility is being restored on UK dairy farms.

Our research

We revealed a 40-year decline in fertility among dairy cows, associated with genetic selection for milk yield and imbalanced nutrition. We established genetic characteristics of fertility traits and used records from ≈ 1.4 m daughters of 18,000 sires to generate a Fertility Index for bulls. Cows with high genetic merit for milk yield had low plasma insulin, so we hypothesised that nutrition might enhance fertility. Diets that stimulated insulin increased numbers of cows ovulating, but high insulin was detrimental to oocyte quality. By feeding diets to stimulate insulin in early lactation and lower insulin during the mating period, we increased pregnancy rate without compromising milk yield or cow health.

The benefits of our research

The Fertility Index is used by all UK breeding companies and also for international bull comparisons. It is updated regularly by an SRUC spin-off company (eGenes) and is available to farmers through the DairyCo breeding+ website. Analysis shows that the genetic decline in fertility has been reversed in UK dairy cattle. Dual-phase feeding is impractical on most UK dairy farms, but our commercial partners use insulin predictions to evaluate likely effects of diets on fertility. If cows are not cycling, insulin is stimulated; if cows are cycling, but not conceiving, insulin stimulation is reduced. This has led to significant improvements on commercial farms.

External links

[Addressing fertility through better breeding](#); [Fertility remains a major issue in dairy herds](#); [Is dairy cow fertility a lost cause?](#)

