

Net Feed Efficiency and why it is vital to future profitability

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Efficiency in feed usage within farmed animal production systems lies at the heart of profitability. Since feed represents approximately 70% of variable costs, improving feed utilisation and efficiency can make major savings in costs for every kg of beef sold. However, improving overall systems efficiency, especially in feed usage is also one of the main ways to reduce the harmful methane and nitrous oxide emissions (Greenhouse Gases) from animal production.

From a wider public perspective, an agenda starting with global climate change and how to reduce Greenhouse Gas emissions very quickly becomes focussed on improving the underlying efficiency of traditional animal production enterprises. This overall improvement in production efficiency reduces Greenhouse Gas emissions per unit of saleable product consumed by humans and in addition, also improves feed and fixed cost efficiencies for the farmer.

Consequently, these complimentary objectives of reduced Greenhouse Gases and improvements in efficiency is one of the main driving forces behind Innovate UK's decision to award BIG Ltd this substantial grant.

What is Net Feed Efficiency?

Net Feed Efficiency (NFE) is a biological measure of efficiency that seeks to disentangle the underlying effects of improved metabolic efficiency from the apparent improvement in efficiency that can be associated with animals simply getting bigger. The traditional Feed Conversion Ratio (FCR) value is highly correlated with higher growth rates and bigger animals so that better FCR figures does not necessarily mean real improvements in underlying biological feed efficiency or profitability.

The mathematical derivation of NFE from daily feed intake and live weight gain figures identifies the underlying biological efficiency of the animal at a metabolic level but does it in such a way that is independent of both daily growth rate and mature body size. Using NFE rather than FCR as the measure of true biological efficiency and basing selection procedures on this measure will achieve the optimum rate of genetic improvement in the shortest time possible.

The NFE unit at Wold Farm and its operation in practice

The costs and technology associated with retrieving data to measure NFE in beef cattle are high and complex and this was the driver behind BIG Ltd seeking grant funding from the Technology Strategy Board to establish the new unit at Wold Farm in East Yorkshire. This commercial unit is the first of its kind in the UK and will establish NFE measurement for the Stabiliser breed as a ground breaking facility focused on improving efficiency and reducing costs for Stabiliser breeders and their commercial farmer customers.

The NFE unit measures both feed intake and live weight gain very accurately in young breeding bulls

and related steers using GrowSafe feed intake technology and software designed for this purpose by a specialised Canadian technology provider. The system allows individual feed intake data to be collected on group housed animals by using RFID ear tags detected by an antenna moulded into the rim of the feed bunker. Each individual meal is recorded for each individual animal continuously for a period of eight weeks. For each batch of 80 animals in the unit at any one time, this can generate between 3000 and 5000 meal events per day with all data stored on computer via a wireless transmission link from the feed bunker panels to a base station feeding the main computer which is housed in a dedicated office.

Configuration of the test groups is balanced for farm of origin, sire, age and individual live weight and will be drawn from all the main sire families along with the new imported bloodlines to give a broad representation of the Stabiliser population. Subsequent statistical analysis of this large dataset will derive the NFE values for individual animals and allow initial selection of future breeding stock on the basis of their phenotypic NFE rankings. After several years' worth of data has been collected from the unit at Wold Farm, then SRUC geneticists will be able to develop EBVs based on these NFE values.

A central animal test facility requires high standards of health status and with this in mind all animals entering the facility must comply with following statutory health protocol.



Health Protocols for animals entering the NFE Test Centre

Pre-weaning vaccinations

IBR

Marker vaccine only

Second dose on centre 6 months later

RSV

Vaccinate with Bovipast or equivalent to cover RSV & pasteurella

Post Weaning

Isolate for one month after weaning

Tests

BVD antigen pre-vaccination

TB

Vaccination

BVD

Copies of TB and BVD test reports and dates of vaccination for RSV and IBR must be available for inspection before movement.

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