

Getting ready for the Beef Efficiency Scheme (BES)

Background

Beef production is increasingly under a spotlight, rightly or wrongly, for being a significant contributor to climate change due to methane emissions from rumen enteric fermentation.

The objective of the Beef Efficiency Scheme is to assist in the development of your suckler herd to become as efficient as possible. Increasing efficiency will reduce the emissions from beef production and also improve overall herd profitability making your herd more sustainable both economically and environmentally.

This is a five year scheme which will contribute to a range of improvements focussing on cattle genetics and management practice on-farm.

The full impact of the scheme will not be realised for several years. We would expect the principal impacts to be improved genetic selection in respect of growth rates, feed conversion, maternal behaviour, nutritional practice and disease resistance. Importantly, these improvements will all be cumulative.

In recognition of the extra work involved in collecting and entering data, the Beef Efficiency Scheme will pay you, as a participating suckled calf producer, each year for the first three years a payment equivalent to approximately £30 per calf, which will be paid on an area basis.

Day to Day operation

The Beef Efficiency Scheme data recording system is confidential and hosted on the ScotEID system. The design is being developed to be as simple as possible for you to use, e.g. the system will utilise the information you record on the Cattle Tracing System (CTS).

All the data must be completed. However, one of the most important records is the weight of your suckled calves, which should be recorded as close to weaning as practical, this is because a calf weaning weight is the best indicator of the mother's milk score. (The BES requires every calf to be weighed before it is 460 days of age).

A key ambition of the scheme is to dramatically increase the amount of animal weighing that takes place routinely on farms, although it is recognised that many herds will not have weighing equipment. If you are not in a position to purchase weigh bars or a weigh crate it is recommended that you borrow or hire a weigh crate, particularly if you don't sell your calves at weaning. However, you will be able to weigh your calves as a batch at market and calculate the average weight per calf.

If you are reliant on market weights you should ensure your sales batches are as even sized as possible.

The data set listed within the BES calving diary make up the compulsory components of the scheme. After you have registered your calf(s) on CTS / BCMS this will automatically create a 'to-do' reminder list on the BES system and then you, or whoever assists with administration, can quickly enter the information from your BES calving diary or other records. The BES system will take around 48 hrs to be updated with the calf registration information from CTS.

The to-do list will make some assumptions to create reminders, e.g. for any cow that is culled or has died the Beef Efficiency Scheme system will ask you to record the reasons – see page **109** of the calving Diary.

To be eligible for payment, (the first will be in March 2017) you will need to complete your final to-do list at the end of each scheme year, this will mean that it is very easy

to meet requirements. If you have any problems, the **ScotEID help desk on 01466 794 323** is available from 9am till 5pm of each weekday to give you a hand.

Sampling

Each year you will be asked to take an ear tissue sample from 20% of your calves for genotyping. The selection criteria will be based on the quality of recorded data and usefulness in terms of providing information for the development of genomic breeding values later on in the scheme.

You will be informed of which calves have to be tested. The tissue tags and method of returning the sample will be supplied to you at that time. This is likely to be a management tagging system that contains a sample tube to preserve the sample for DNA extraction (this is rather than sampling using the official UK ministry (crown logo) tag within 20 days of birth). The management tissue tag can be subsequently removed before sale if required, or left attached to easily indicate that the calf has been sampled. Each sample pot will have the official ID and bar code to reduce any administrative error, on farm or in the lab.

(Unfortunately genetic sampling cannot use a BVD tissue sample because the BVD sample includes a short term preservative and the genetic material will degrade and no longer be suitable for genotyping)

Management decisions

Each year, the Beef Efficiency Scheme will require you to note in the system, three management improvements you will make to improve your herd and production system. The description of the management improvement need only be very simple, examples might include:-

- Review winter diet to reduce amount of purchased feed;
- Body Condition Score cows at housing and diet to achieve BCS 3.5 at calving;
- Provide a calf creep area 30 days after calving to reduce maternal bond and thereby time to first heat;
- Plan to develop / grow replacement heifers – 65-70% mature weight at 15 months for bulling;

- Blood sample and re-assess mineral use and type;
- Identify high risk areas of fluke, fence off wet areas and attend to leaking troughs, pipes and drains;
- Lime application on low pH grazing fields to encourage clover growth;
- Oestrus synchronisation of selected cows for serving with fixed time AI with bull with high maternal values;
- Scan cows and cull empty cows early;
- Using breeding value to inform decisions on which replacement cows to retain and/or bulls to purchase. (As the scheme develops the amount of information you will get, and it's accuracy, will increase)

Practical guides for management options to improve the carbon footprint can be found at the Farming for a Better Climate website -

www.farmingforabetterclimate.org

Advice

During the lifetime of the Beef Efficiency Scheme, advisory services will be developed, including feedback with analysis of data and progress towards the schemes objective, to assist you in developing your suckler herd and, in making the national herd as efficient as possible.

The main advice streams will include an online video library that will be available from your secure BES webpage where you record your herd information. Advisory services will be free of charge as part of the scheme and taking part will be compulsory to help you with your management decisions and assist with monitoring the improvements. There will be a number of different ways in which advice will be rolled out, for example year one is an on-line video.

Compliance

Cross Compliance

Applying for the Beef Efficiency Scheme does not increase your chance of breaching cross compliance rules. As the recording of sire ID is not a requirement for cross

Culled annually for being empty	Less than 5%
% calving to weaning a calf	95%
80% calved in	6 weeks
Annual replacement rate	16 – 18%
Age at 1st calving	24 months

Using a simple example, a very good herd of 100 cows with a 95% compact calving and weaned calf weight average of 300 Kgs will produce 12 more calves than the same sized below-average herd with an 83% loose calving with a weaned weight average of 274Kgs; the efficient herd will sell 5,758Kgs more suckled calf weight, which at an average price of £2.50 per Kg is £14,395 more profit.

Following weaning, efficiency is measured by the days to finish with consistent weights at finish to meet market requirements using a predominantly grass based diet. (With respect to greenhouse gases, concentrate rations are more efficiently fed to non-ruminants.)

Greenhouse gases

As well as developing improved herd efficiency to increase farm profitability, it is vital that the Scottish beef herd will be able to prove ongoing that it is a 'green' industry able to demonstrate improvements as a converter of grass and clover into very high value essential protein for a balanced human diet.

The principle greenhouse gas from the beef herd is methane produced by rumen bacteria. Pound for pound, the comparative impact of methane on climate change is calculated to be around 25 times greater than carbon dioxide over a 100-year period.

Feed that is converted into and released as methane is feed not being converted into meat and is consequently a net loss both in economic and environmental terms.

Work is on-going concerning diet components that increase rumen efficiency.

In terms of maternal efficiency a barren cow or one that loses its calf, for whatever reason, is obviously entirely unproductive and will have produced a volume of methane during the year for no gain.

The Beef Efficiency Scheme data recording system, over time, will automatically calculate each herd's efficiency and therefore its effect on reducing greenhouse gas emissions in proportion to its beef production, and collate these figures to provide a measure of efficiency of the national Scottish herd.

Genetics

The strategy of the Beef Efficiency Scheme, to meet the objective of increasing herd efficiency, is to assist you in the selection of the best genetics for breeding heifer replacements. That is, which cows in your herd should only be used for crossing with terminal sires and, importantly, which cows in your herd are best for crossing with sires with high maternal traits to produce the next generation of well-balanced breeding cows, either for your own herd or for sale – irrespective of breed or cross breed.

It is expected that after approximately three years of data collection (targeting year 3) and analysis through the Beef Efficiency Scheme it should be possible to score your breeding herd, noting cows with high maternal traits to be used for breeding heifer replacements, and cows with lower maternal traits to be crossed with terminal sires. In the longer term it will be possible to develop a national scoring system so that commercial heifers with high maternal traits can be easily recognised for sale.

Genomics

In addition to genetic merit estimated using “traditional” pedigree information, more recently an extra source of information has been used to guide selection decisions in many livestock species. This extra source of information is using the DNA profile of the animal to assess if the animal has good, bad or average genes for each trait being evaluated. This DNA profile is typically in the form of a genotype, derived from DNA extracted from an appropriate tissue/blood sample.

The key to genotype technology is working across the national herd with farmers recording observable characteristics (traits) of each individual cow and calf. The combination of such genotypes with performance (and pedigree) information to estimate the genetic merit of animals is more commonly referred to as Genomic Breeding Values (GBVs).

Once a tissue sample has been provided for a young animal, the DNA key can be applied to the animal's genotype to assess what combinations of genes they have inherited for each trait. This will then be a (genetic) predictor of the expected future performance of the animal. The more information available on animals in the reference population the better the predictions of future performance will be. The selection of animals for genotyping under the scheme will be key to help us maximise the potential benefit to the scheme as a whole.

In the Beef Efficiency Scheme, genotypes will be used to develop accurate genomic prediction equations to assess the genetic potential of an individual animal. This information will, in turn, be used to make genetic improvement. Genotyping a large number of animals is necessary to attain acceptable levels of reliability.

One category of genetic difference frequently used for comparison is Single Nucleotide Polymorphisms or SNPs. SNPs are used as genetic markers to track the family heritage of regions of DNA or of individual animals. Low-cost tests are being developed that allow an animal's entire genome to be inferred from a relatively small number of SNPs, thereby giving valuable information as to its breeding value.

The research and development of GBV's within Scotland will significantly assist the ability to select the best genetics for breeding heifer replacements, with genomic predictions potentially providing a test to identify an undesirable genetic trait and/or desirable traits in a young animal.

An example is that there is limited research on calf mortality pre-registration, and therefore traits recorded on page **112** of your Calving Diary will provide a real insight into where genetic improvement may be possible to reduce the incidence of pre-registration mortality.