Opportunities for the use of Artificial Insemination (AI) in the Suckler Herd

Uptake of AI in the beef suckler herd until now has been poor with probably <10% of breeding beef cows bred by AI. With advances in oestrus synchronisation programmes using combinations of intra-vaginal implants (eg CIDR™) and prostaglandin/GnRH injections it is now possible to get excellent conception rates (65-70%) to fixed-time AI in beef cows and heifers.

What are the potential advantages of using AI in commercial beef suckler herds?

• Access to superior EBV bulls to produce calf crop to suit the market/management system on farm and increase output (see later)
• Identifying superior dams/heifers in the herd and using maternal trait AI sires (or female sexed semen) to breed quality replacement heifers.
• Potential to improve calving pattern by serving large groups of cows/heifers on day 1 of the breeding period.
• Reduction in calving problems by selecting bulls with high accuracy calving ease EBV’s
• Opportunity to reduce bull stud especially if an “easy calving” bull is kept solely to breed small numbers of heifers

How much does a natural service calf cost to produce?

Many farmers assume AI must be more expensive then natural service however the potential extra output can outweigh the system costs. The facts are that the average stock bull lifespan is 4 working seasons and many produce only 30-40 calves per year or less. Based on 4 year lifespan before cull, and purchase price of £4000, a rough calculation based on depreciation , variable and fixed costs puts the cost of a reasonable quality stock bull at around £1600/year on farm (Lowman 2013). If this bull only generates 30 calves per year then each calf has cost £53 to get on the ground.

What is the cost of an AI generated calf?

The cost of synchronisation and AI will vary depending on protocol used, conception rates achieved, and semen/technician costs but is likely to be similar to natural service costs at around £50 per pregnancy/calf generated.

Potential Extra Output Value of AI Calves

If we assume the cost of generating an AI calf is similar to the cost of a stock bull calf then to justify AI there needs to be some economic advantage. There is potential to generate significant extra value in AI calves due to superior weights and carcase quality over “average” bulls.

Take an example of 40 cows bred by synchronisation and AI (AI sire 200 day weight EBV +30kg) compared to 40 cows run with average bull of same breed for 1st service. All 40 cows will be served on day 1 of breeding by AI but the bull group will be served at random over the first 21 days of mating as they come in season. If we assume 60% conception rate to both AI and bull then 24 pregnancies/calves will result from the first cycle of mating in both groups but with the AI group the calves will be on average around 11 days older on a fixed weaning date. Also the AI calves should have superior growth potential if a bull with superior 200day EBV has been selected.
Assuming average daily weight gain of 1kg then the 24 AI calves will generate $24 \times 11 \times 1\text{kg} = 264\text{Kg}$ extra output at weaning.

Also 200 day EBV +30 will generate 15kg more beef per calf at weaning compared to average sire = $24 \times 15 = 360\text{kg}$ extra beef output.

**At £2 kg/LW this extra output combined could generate an extra 624kg x £2 = £1248 for the AI bred 40 cow group**

This does not take account of the potential for AI to actually deliver better conception rate in the first 21 days of breeding than natural mating bulls as synchronisation with progesterone implants can effectively treat non-cyclic cows and AI sires can reduce calving problems and calf mortality.

**Use of Sex-sorted Semen**

As the process of preparing and freezing sexed semen is advancing it is now quite possible to achieve conception rates of 50-55% with this product in beef cows/heifers meaning it is a realistic option for producers to identify superior cows or heifers to generate replacements from. A smaller proportion of the herd can then be bred to specific maternal trait sires allowing the majority to be bred to terminal sires or perhaps with male sexed semen.

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