Selecting beef AI sires for the dairy herd

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The contribution of the calf enterprise to the profit of the dairy farm is generally considered small, with beef bull selection on dairy farms often not considered a high priority. However, this is likely to change in the years ahead as the rapid rate of expansion of the dairy herd is set to decline and improvements in dairy herd fertility combine to reduce the proportion of dairy breed calves required on Irish dairy farms.

This is presenting Irish dairy farmers with the opportunity to increase the proportion of beef breed calves born on their farms. This will increase both the value of calf sales and the marketability of the calves, as there is a larger market for beef breed than for dairy breed dairy calves.

Calves from the dairy herd for beef production

The dairy beef sector in Ireland is an important and growing industry. The national dairy herd will have increased by an estimated 500,000 cows between 2010 and 2018.

With it has come an increase in the number of dairy calves available for beef production. The use of breeding tools, such as the EBI, has increased the fertility of Irish dairy herds.

Consequently, fewer cows need to be bred to dairy bulls to produce heifer replacements in the coming years. This will allow dairy farmers to use more beef genetics in the years ahead. While the contribution of the calf enterprise to dairy farm profit is small, there are opportunities to increase its value and contribution in the years ahead.

In 2016, 30% of dairy calves born were replacement heifers (398,000), (AIM, 2016). The remaining calves born (approximately 900,000) were available for beef production (see Figure 1). Male dairy calves account for 45% of these dairy beef calves. Early-maturing crossbred male and female calves (of the Aberdeen Angus and Hereford breeds) account for a similar number, with a variety of different breeds making up the balance.

Choosing the right beef bull for your dairy herd

Three key traits are of interest to dairy farmers in selecting beef bulls for their herds:

- Calving ease.
- Gestation length.
- Carcase weight.

Two key reasons for using beef AI rather than beef stock bulls on the farm are:

- The ability to choose suitable proven bulls for the herd – particularly among those proven for ease of calving and gestation length (see Table 1).
- To reduce the number of stock bulls on the farm – as a rough rule of thumb, every three weeks you halve the number of bulls required (see Table 2).

Using the current active beef bull list on the ICBF website, 66 beef AI bulls meet the <4% calving ease with greater than 90% reliability. This falls to 51 bulls when a gestation length target of less than 1.5 days with 70% reliability is included. The number declines further to 14 bulls when the carcase weight target is included.

However, it's important to note that there are beef bulls available that meet all three targets. A small number of suitable beef bulls are also available for use on heifers.

In a 100 cow compactly calved dairy herd with 20 replacement heifers also bred, the following is the pattern of breeding during each three week period of the breeding season.

In the example detailed in Table 2, if stock bulls were introduced at the start of the second three weeks, a minimum of two such bulls are required because there are 56 cows and heifers for breeding.

Continuing to AI for a further three weeks means that only one stock bull is required. Some dairy farmers are considering the use of stock bulls exclusively across their herds. I generally recommend that AI is used in all dairy herds for 6 weeks, particularly in larger herds because the number of bulls required is large. The experience of farmers running larger units is that the wastage of stock bulls is very high and very costly. Delaying the introduction of bulls until later in the breeding season dramatically reduces the number required to finish off the breeding season.

IN SUMMARY

Sexed semen

Sexed semen is a revolutionary animal breeding technology that enables the required number of replacement heifers to be produced from a targeted proportion of the herd (i.e., highest EBI, greatest fertility potential etc.).

This provides dairy farmers with the opportunity to increase revenue by breeding the remainder of the herd with semen from beef sires. In Ireland, beef sired calves from the dairy herd (male or female) attract a premium of approximately €150 compared to bull calves sired by a dairy sire.

Clearly, this represents an economic stimulus to increase the proportion of offspring from the dairy herd with beef sires, and would increase the quality and value of the beef derived from the dairy herd.

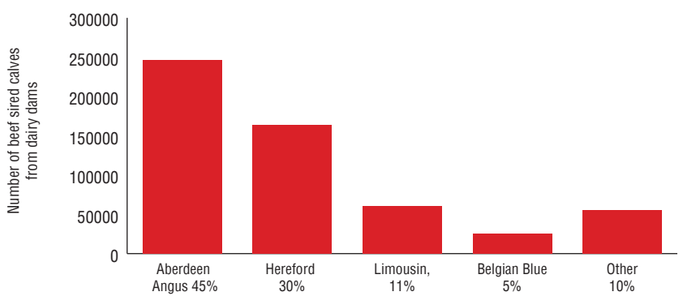
A collaborative field trial involving Teagasc, ICBF, NCBC and Dovea Genetics will be conducted in Irish dairy herds during the spring 2018 breeding season to evaluate the fertility of the newest technology available for producing semen sexed.

Dairy beef

Suitable beef sires would generate progeny that are easy-calving with short-gestation length, but also have suitable terminal traits to produce offspring that meet key market specifications at slaughter (conformation grade O= or greater; fat score 3-; carcase weight >280 kg).

In the longer term, a dairy-beef breeding programme and a dairy-beef index will be required to accelerate genetic gain and identify the most suitable beef bulls to meet the requirements of both the dairy farmer (short gestation, easy calving) and the beef farmer (good growth rates and terminal beef traits).

Figure 1
Number of calves from dairy herds by sire breed in 2016 (AIM, 2016).



> A mixture of varieties with different uses is a good idea

Table 1: Targets when selecting AI beef bulls for dairy cows and heifers

Trait (reliability)	Cows	Number	Heifers	Number
Calving ease (> 90% reliability)	<4%	66	<2%	16
Gestation (> 70% reliability)	< +1.5 days Preferably negative	51	< +1.5 days Preferably negative	16
Carcase weight (> 70% reliability)	> + 8kg Preferably greater	14	> +6 kg Preferably greater	4

Table 2: Breeding pattern during the breeding season of a compactly calved 100-cow dairy herd

	Cows	Heifers
Bred in the first 3 weeks	90	20
Bred in the second 3 weeks	50	6
Repeats in the third 3 weeks	22	2
Repeats in the fourth 3 weeks	10	-

Farmer profile p14

Today's farm

Farmer profile

John Lyons is dairy farming on the outskirts of Banagher, Co Offaly. He operates a very simple grass-based system, keeping 80 cows plus approximately 20 replacement units. All beef stock are sold shortly after birth. He has a milking platform of 27ha that runs down to meet the River Shannon. Some land often floods over the winter.

Each year, John breeds approximately 60% of his milking herd plus all maiden heifers to dairy sires. This is enough dairy genetics to generate sufficient replacements for his herd. The remaining 40% of cows are bred to beef AI.

One-hundred percent AI is used with both the cows and heifers. No stock bull is kept on the farm.

John has no plans to increase cow numbers above 80. He was milking 60 cows five years ago and gradually increased to the existing number, which John feels is a good fit for the available land, facilities and labour.

Milk recording records are used to help determine the best cows in the herd, so they can get a dairy AI straw. Poorer-performing cows are AI-ed to beef sires.

The compact nature of calving on this farm (87% six-week calving rate average over past three years) means that John has the luxury of using some beef AI from the outset of the breeding season. This means that there are high-value beef calves available for sale from the very start of the calving season.

He uses a combination of both Belgian Blue (BB) and Hereford (HE) sires.

According to John: "The main reason I use Belgian Blue is that the calves are worth a lot more and are very easy to sell. These calves sell for up to €350/head at a few weeks old.

"The two things I look for in selecting beef bulls are ease of calving and gestation length. The BB bull I have been using the last few years has been very good on both these fronts. Twenty BB calves sold at €350 each, or €7,000, is a welcome addition to cashflow, particularly if they are paid for in early spring when milk volumes are low."

John also sells approximately eight to 10 Hereford-cross heifer calves annually to his brother Paddy, a local suckler farmer. Paddy is in the process of converting his Limousin-continental-cross suckler herd to a Friesian-Hereford-cross suckler herd. These calves are reared on John's farm to 10 weeks and then transferred at approximately €250/head.

John tried sexed semen five years ago (admittedly that process was probably not as effective as the technology now available). "I used 10 sexed semen straws on 10 heifers and I only got two calves from them, although both were heifers.

"If it can be got to work at a sufficiently high and reliable level, I would be very enthusiastic about using it. I would use sexed semen dairy straws on the heifers and the rest of the animals would be sired by beef bulls."

John Lyons and Jim Moyles with a couple of John's Belgian Blue cross calves.