# Fertility Management on the Greenfield Farm in 2012


## Summary

- Maximising the proportion of the herd that successfully establish pregnancy in the first 6 weeks after mating start date (MSD) is a prerequisite for a concentrated calving pattern.
- During the 2011 breeding season conception rate to AI was poor resulting in a prolonged calving pattern during 2012.
- The strategy to overcome this issue included: breeding maiden heifers earlier than mature herd, using a CIDR-based fix-time AI treatment on a proportion of late calving cows, continue to use high EBI (high fertility sub-index) sires.
- The bulls selected for 2012 had an average fertility sub index of €110 and a combined fat and protein kgs of 33kgs.
- The bulls were all selected from the EBI index. They bulls selected were :LHZ,SFS, MSF,TEZ,TJF,MOK,MJD,HYZ,VBT,TIO,WTL,OKM,PSH, and PKU.


## Introduction

While fertility levels have improved a little in recent years, current performance continues to be substantially below optimum, negatively impacting dairy farm profits. Data from the ICBF database indicate that the median calving date in Irish spring calving herds is the 9th of March. Performance figures indicate a 21-day submission rate of 60%, 1st service pregnancy rate of 53%, empty rates of 17%, and a 6-week calving rate of 52%. These levels are well below the targets of a median calving date of the 20th of February, 21-day submission rate of 90%, 1st service pregnancy rate of 60%, empty rate of <10% and a 6-week calving rate of 90%. In a non quota scenario, earlier mean calving date will result in greater profitability at farm level. Improved reproductive performance at farm level will be achieved through the application of an optimum breeding management programme, good herd nutritional status (body condition score), increased number and quality of replacements, maintaining a good herd health status and the use of genetically superior AI bulls (EBI).

Maximising the proportion of the herd that successfully establish pregnancy in the first 6 weeks after mating start date (MSD) is a prerequisite for a concentrated calving pattern. This requires high submission rates and good conception rates during the breeding season. This is only possible, however, if the herd already has an existing compact calving pattern. This is because the single biggest factor that affects fertility performance of the individual cow during the breeding season is how long she has calved. A poor calving pattern leads to a compounding of the problem year on year. Cows that are calved longest at the farm MSD have already resumed cyclicity, display strong heats, and have good likelihood of conception. On the other hand, cows that calve within 6 weeks before MSD or after MSD are more likely to be non-cycling at MSD and are less likely to conceive at first insemination.

**Greenfield Farm**

The herd on the Greenfield farm was assembled from a number of herds in late 2009. In the 2011 breeding season, fertility performance was poor (Table 1).

Table 1. Fertility in 2011 and industry targets for dairy herd fertility

| | **2011** | **Target** |
|---|---|---|
| 3 week submission rate (%) | 72 | 90 |
| First service pregnancy rate (%) | 34 | 60 |
| 6 week in-calf rate (%) | 56 | 75 |
| Overall pregnancy rate (%) | 87 | >90 |

The 3-week submission rate was below target. Though 96% of the herd were calved by MSD, 28% of cows were in the category of late calving cows (i.e., calving within 6 weeks before MSD or after MSD). Of greater concern, however, was the very low first service pregnancy rate of 34%. This is well below the industry target, and it is not possible to attain a compact calving pattern when pregnancy rates are this low. Genetically, the herd comprised relatively high EBI Holstein-Friesians and approximately 20% crossbred cows indicating the potential for good reproductive efficiency. The EBI of the herd in 2011 was 101. Some of the cows had no EBI figures so the EBI figure for 2011 is only based on 65% of the herd.

**In 2012 more emphasis was put on everything that had to do with the breeding season such as:**

- Condition scored the cows (avg. condition score was 2.90 at mating start date)
- Macro and trace minerals were given to the cows via the water system
- Pre – heat detection was carried out 3 weeks before the breeding season
- Heifers were bred 1 week before the cows
- A breeding chart was placed on the wall of the dairy and updated daily
- Refresher DIY course was attended by farm staff

**Breeding Management 2012**

In late March 2012, it was decided to impose a strategy to improve the herd calving pattern. This strategy focused on the reproductive management of both heifers and lactating cows.

**Heifer management**

The 2012 farm MSD was April 23rd. It was decided to start breeding the heifers 7 days earlier on April 16th. This decision was taken for a number of reasons:

1. The heifers would calve down early in 2013, giving them a good chance to start cycling and achieve high levels of fertility during the 2013 breeding season.
2. Breeding the heifers earlier than the cows for a number of years will play an important role in improving the overall herd calving pattern.
3. Breeding the heifers early and using synchronisation to get most heifers bred within 15 days allowed staff to focus primarily on breeding the cows after the farm MSD.

The heifer reproductive management was as follows:

- Kamar heat mount detectors were applied to 103 heifers on Monday 16th April.
- The heifers were watched for signs of heat 4-5 times per day for the first 10 days, and inseminated based on observed heat. Insemination was performed once daily using a commercial AI technician service. Jersey crossbred heifers (n = 67) were inseminated using MJI, Friesian heifers (n = 33) were inseminated using OKM, and Norwegian Red crossbred heifers (n = 3) were inseminated using EKE.
- Of the 103 heifers, 43 were bred to a natural heat in the first 10 days.
- On Wednesday April 25th, all heifers not yet bred (n = 60) were injected with prostaglandin (2.0 mL Estrumate i.m.). A further 50 heifers came into heat after the prostaglandin injection.
- This resulted in 90% (n = 93) of the heifers being bred with AI within 15 days, and Jersey crossbred and Aberdeen Angus easy calving stock bulls were used for natural service thereafter.
- **Lactating cow management**

Pre-breeding heat detection of the lactating cows began on March 28th. Yellow tail paint was applied to all lactating cows, and cows were examined for removal of tail paint every Monday and Thursday morning. When tail paint was removed, the cow number and date was recorded, and her tail paint was topped up with the same colour. To ensure accurate and timely recording of insemination data throughout the breeding season, cow numbers and pre-breeding heat dates were entered on breeding charts, which were placed on the wall in the farm office. After the MSD, all insemination dates were entered on these charts on a daily basis as soon as AI was completed after the morning milking. Insemination was performed once daily by farm staff. Blue tail paint was applied to all cows following insemination.

On April 20th (3 days before MSD), all cows that were calved more than 32 days and had not yet been recorded as being in heat were examined by ultrasound to determine (1) if they were cycling and (2) if the uterus was clean. A total of 34 cows were scanned on this date. Of these, 24 cows that were either not cycling or were cycling but calved less than 60 days were treated with a CIDR-based treatment (Figure 1). Cows were injected with GnRH (2.5 mL Receptal i.m.) and a CIDR was inserted on day 0. On day 7, cows were injected with prostaglandin (5 mL Lutalyse i.m.) and the CIDR was removed on day 8 at the morning milking. Cows were again injected with GnRH (2.5 mL Receptal i.m.) on day 9 after the evening milking, and fixed-time AI was carried out on day 10 after the morning milking. For ease of identification and to ensure compliance to the treatment protocol, treated cows were marked across the back with red tail paint. Treated animals were separated from the main herd when drafted out for prostaglandin treatment after the AM milking, and were re-introduced back in to the main herd at the PM milking on the day AI was completed.

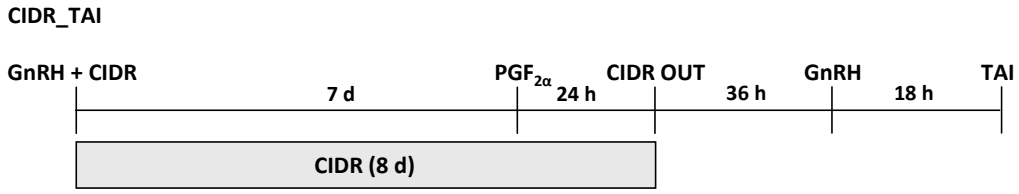


**Figure 1.** CIDR-TAI synchronisation protocol used for treating lactating dairy cows that were not cycling or lactating dairy cows that were cycling but were calved less than 60 days.

The average BCS of the cows treated with the CIDR protocol was 2.66 (range 2.00 – 3.00) and the average days after calving was 51 (range 35 - 88). The decision to treat these cows was taken to increase the number of cows bred in the first 3 weeks of the breeding season. Cows treated with the CIDR protocol were bred on April 30th. In addition, 5 cows were diagnosed with a uterine infection, and were washed out with an intra-uterine antibiotic. The remaining 5 cows did not require treatment.

The 3 week submission rate for lactating cows in the 2012 breeding season was 68%. Again, this figure is disappointing, but not too surprising given the high proportion of late calving cows in 2012. There were 47% of cows left to calve after the 12th March

in 2012. On the 6th June the cows were scanned on the Greenfield farm. Out of the 102 cows scanned, 90 were scanned in calf, and 12 out of the 24 cows treated with CIDRS were in calf. This was a positive result. Cows that were calved more than 32 days and still not bred were scanned as well. One of these cows was given the CIDR programme and four of the cows were treated for uterine infection. Based on these results there will be 100 cows and 75 heifers calving down in the first two weeks of the 2013 calving season. So far in the breeding season there is a non return rate of 60% for the first three weeks. It is too early to say what the six week non return rate is. It is anticipated that the period of AI use will be 8 to 9 weeks, with bulls used to mop up for an additional 3 to 4 weeks. Mating End Date is scheduled for mid-July, resulting in a 12 week breeding season.

**Results**

- 283 cows were presented for breeding in total on the Greenfield farm for breeding in 2012. The 24 day submission rate which included cows not yet calved was 73%.
- Bulls left the cows on the 21st July, after a 13 week breeding season, 11% of the cows were NIC.
- After an 8 week breeding season for heifers: 103/109 heifers were not in calf.
- There will be no cows calving in May 2013, as the decision was made to take the bull from the cows on the 21st July 2013.
- Up to 70% of the cows and heifers will be calved by the middle of February 2013.

**The future**

In the coming years, heifers will continue to be bred earlier than the lactating herd in an attempt to improve the calving pattern. The fertility performance of the lactating herd will be examined in detail at the end of the breeding season, and a decision made on the level of synchronisation required in next years breeding season. Body condition score management during late lactation and the dry period is a critical component of successful reproductive management. Too many cows calved in excessively high BCS in spring 2012, a reflection of excessively long dry periods with ad libitum access to high quality silage, and resulted in some cows with clinical ketosis. Nutritional management in the coming winter will be adjusted to prevent this reoccurring. The bulls selected for AI use will continue to have a high fertility sub-index. To available of hybrid vigour (estimated to be worth in excess of €100 per lactation in the first cross) a two way crossbreeding strategy will continue to be implemented using high EBI Jersey and Holstein-Friesian sires. Long term approximately €66 per lactation (in addition to improvements in EBI) due to hybrid vigour is anticipated. With each new generation of heifers, this will result in higher genetic merit for fertility, which should translate into better reproductive performance and a longer productive lifespan in the herd.