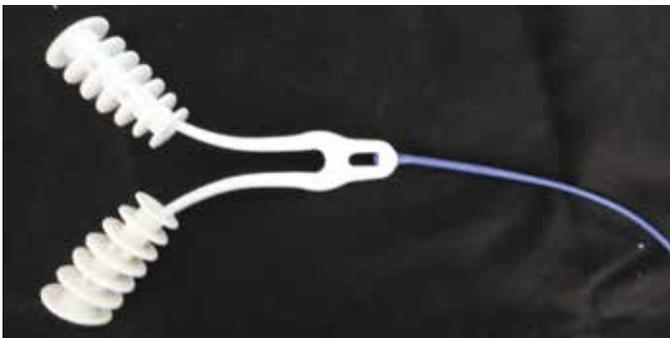


# Benefits of Artificial Insemination in Angus Herds

No matter if you are a commercial or seed stock producer, increasing the rate of genetic improvement or being able to access superior genetics to incorporate into your herd is generally a priority. Most breeders would appreciate that artificial insemination (AI) or embryo transfer (ET) are tools best utilised to disseminate genetics into their herds.

Fixed-time AI (FTAI) provides a practical and feasible option for commercial and stud breeders to implement AI into their herds as 100% of the herd can be inseminated at a predetermined time. The implementation of FTAI requires no detections of oestrus, only an AI technician on one occasion, and often results in more calves produced by AI than oestrus detection programs. Therefore, FTAI can suit many herds, whether they are inseminating small numbers or the whole herd.

Synchrony treatments which include an intravaginal progesterone releasing device such as the Cue-Mate<sup>®</sup>, allow an entire mob of cows and heifers to have a synchronised ovulation. In FTAI approximately 75% of females will ovulate within a 12 hour window allowing females to be inseminated at a 'fixed time' without the requirement for heat detection.



*Cue-Mate<sup>®</sup> is an intravaginal progesterone releasing device used for synchronising cattle.*

The use of FTAI is increasing as more and more breeders are becoming time poor and lack the on-farm expertise to inseminate cows. With minimal training, synchronisation treatments can be performed by farm staff, with an experienced technician only being required on one occasion for the actual AI of the females.

Alongside the ease of implementing FTAI in beef herds, there are many other benefits that assist commercial breeders to improve their bottom line:

## Access to superior genetics

FTAI allows commercial producers to utilise sires that would not otherwise be available to them, enabling the use of sires most suited to their genetic improvement objectives. As an entire mob of cows can be submitted

to FTAI, more calves sired by higher quality bulls can be produced. This allows commercial breeders to realise their goals, or respond to market trends more quickly than with natural mating.

## Females are inseminated on the first day of the breeding season

With conception rates averaging 55% (Angus Sire Benchmarking Program data) and reports of up to 75% of Angus cows conceiving to FTAI, calving intervals can be substantially compacted. There are a variety of management benefits that result from having a high proportion of females conceive on the first day of the breeding season:

- **Females are more likely to calve every 12 months** – earlier calving cows are easier to get back into calf.
- **Earlier calves are heavier at weaning** – calves that are born early are older at weaning and will weigh more, and thus if sold at weaning are generally of higher value.
- **Calves are mostly of a uniform age** – this increases the ease of genetic appraisal of replacement heifers as an age bias will not occur. Also, a uniform calf drop are easier to market.
- **Surveillance of heifers/cows at calving is reduced** – as heifers and cows will calve in a tighter window, the labour involved in calving surveillance, which can persist for weeks, will be reduced.

## Using Fixed Time AI in the Angus Sire Benchmarking Program

The practicality of FTAI has enabled the variety of sires enrolled in the Angus Sire Benchmarking Project (ASBP) to be spread across the various co-operator herds. Many of these co-operator herds had no previous experience in implementing programs, and yet have yielded attractive results on a consistent basis (Figure 1 overleaf).

In the 2015 Cohort 6 FTAI programs, the average pregnancy rate to FTAI was 59% for multiparous cows (n = 1543; range 54 to 63%), 48.2% for heifers on their first calf (n = 813; range 34 to 63%) and 49% for maiden heifers (n = 203; range 43 to 55%). This data followed a consistent trend with multiparous cows generally giving the best and consistent results of all groups.

The data collected during the six consecutive years of FTAI programs for the ASBP has resulted in unprecedented benefits. The data has been analysed to provide practical and relevant information to Angus breeders about the implementation of artificial breeding into their herds.

Broadly there are three main benefits to synchronising your females for AI, FTAI or ET:

1. **rapid genetic progress** or change,
2. **compacting the calving interval**, and
3. **increasing fertility**.

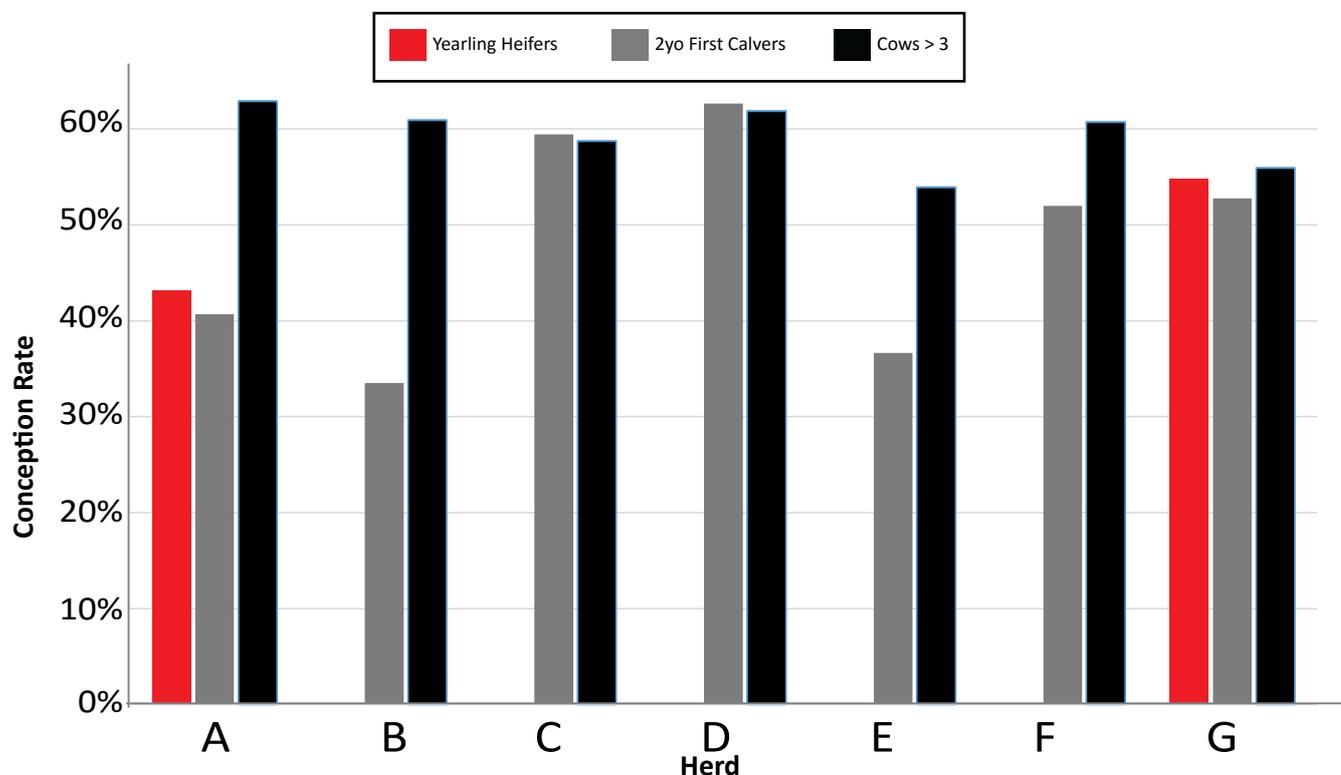


Figure 1 – Pregnancy rates to fixed-time artificial insemination of heifers, heifers on their first calf, and cows enrolled in the Cohort 6 ASBP.

For the purposes of this article, an analysis of the data retrieved from the ASBP FTAI programs will be used to focus on the latter benefits, compacting the calving interval and increasing fertility.

This information provides evidence and supports that synchronisation for AI, FTAI or ET used as a tool in commercial herds can improve profitability, over and above the benefits of genetic gain.

**Increase your weaner weights... earlier calves born over a shorter duration through synchronisation**

A key benefit of synchronising a group of females for AI or FTAI is that the majority of your females can fall pregnant on the very first day of the planned mating. As a result, the majority of calves are then born at the very start of the calving season.

The weaning weights of calves produced from the cow herd on one co-operator station in Cohort 5 of the ASBP were recorded in 2016. The calves were produced from four different mating groups, AI calves (n = 160), and calves born from the backup bulls used in three multi-sire groups, Natural 1 (n = 10), Natural 2 (n = 17) and Natural 3 (n = 38). Figure 2 illustrates the percentages of calves born from each group.

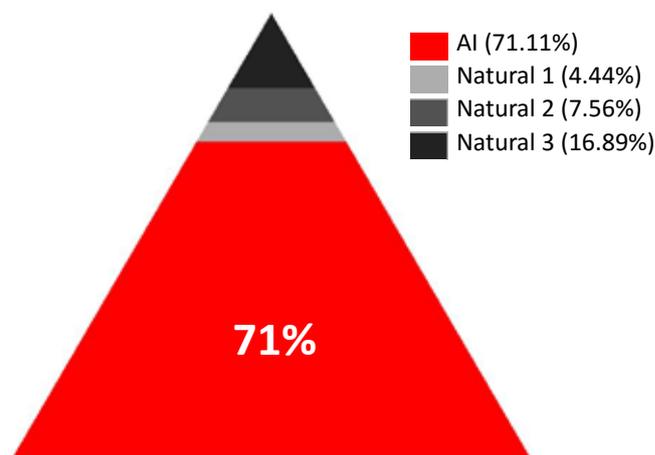


Figure 2 - Numbers of calves born split by AI or natural mating.

Acknowledging that there are genetic influences on the weights of the calves at weaning, the average EBV for 200 day growth has been noted to be +47, +39, +40 and +22, for the AI and Natural 1, 2 and 3 groups, respectively.

However, **it was the time of calving that had the most influence on the weaning weight of the calves in this herd**, with the AI calves having an average age of 205 days at weaning whereas the Natural 1, 2 and 3 calves had an average age at weaning of 181, 186, and 182 days, respectively.

This data provides clear evidence that synchronisation for AI or FTAI can provide practical and profitable benefits to a commercial herd.

Not only were the AI calves an average of 37 kg heavier than the calves from the naturally mated backup bulls (Figure 3), but they also represented 71% of the calves weaned (Figure 2).

This represents significant financial benefits within the market place where liveweight prices determine the financial return. A higher return on heavier calves can cover or contribute substantially to the cost of the program, and the 'icing on the cake' is the genetic and herd management improvements.

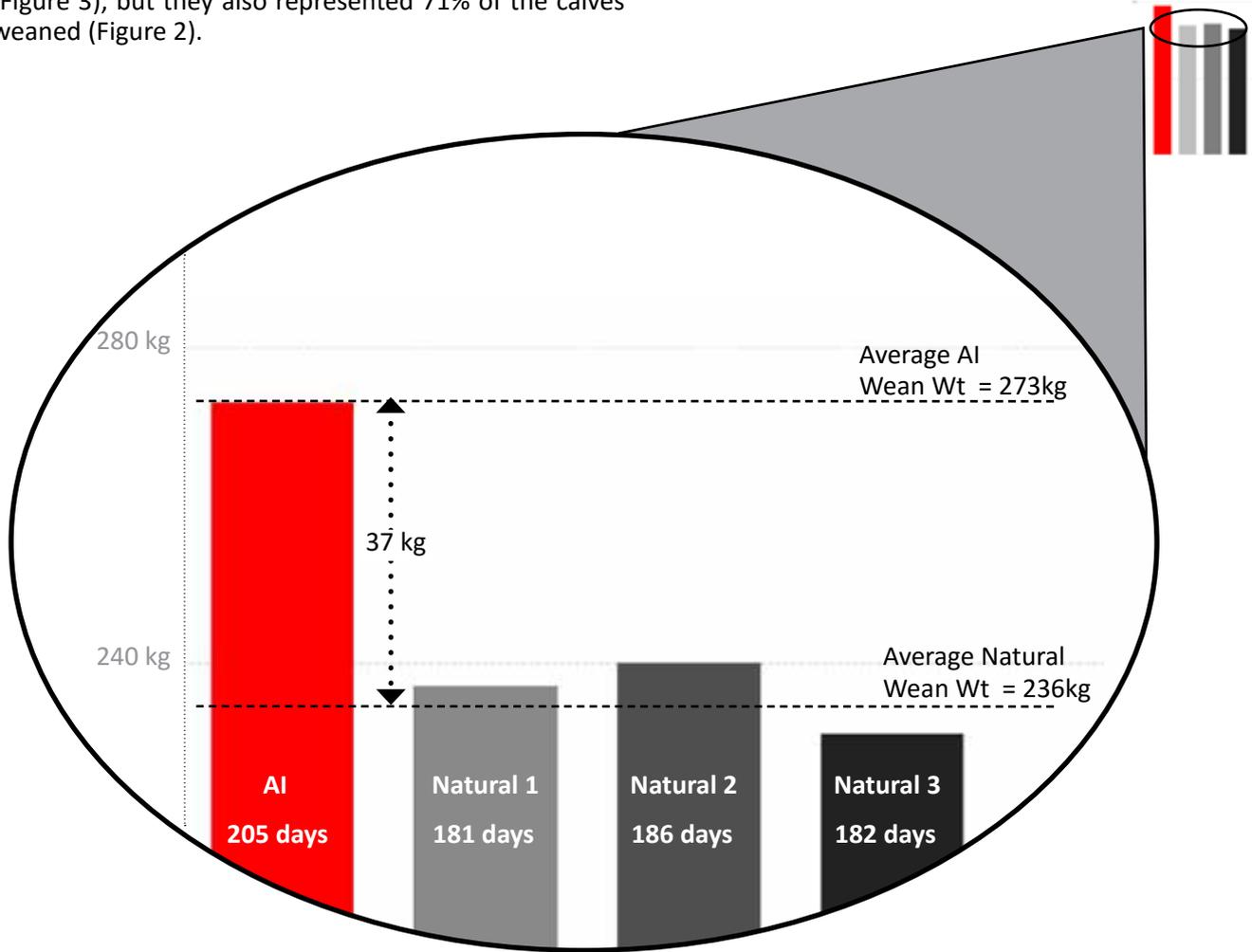


Figure 3 - Comparison of weaning weights of calves produced by AI or natural mating.



### **The added benefits of earlier calving... improving management through synchronisation**

Creating earlier calves through synchronisation FTAI, is not just about heavier weaners. There are many other intangible benefits that go with a uniform weaner group. It is clear that these factors provide benefits to the breeding enterprise, even though the financial benefits can be hard to quantify:

- They can be marketed as a uniform group.
- Calving surveillance occurs over a shorter period of time.
- It is easier to perform a phenotypic assessment and comparisons of the calves.
- There are fewer, later calving cows.
- FTAI can be used as a tool to bring the time of calving earlier.
- Heifer progeny will reach the critical mating weight at a similar time, increasing the likelihood that the majority of the group will conceive earlier in their joining period.



*An even line of calves from Trangie's Cohort 5*

One co-operator herd in the ASBP has been taking advantage of the use of FTAI in their herd to progressively bring the calving date of their herd forward each year. In the Cohort 6 program, this herd deliberately joined their herd 2 weeks earlier than in the Cohort 5 program (Table 1).

	Cohort 5	Cohort 6
AI Date	11/12/14	26/11/15
DOB*	17/9/15	2/9/16
Joined (n)	394	408
Maiden Heifers	56.3	54.8
1st Calvers	70.5	52.7
Cows (>=3 years)	63.4	55.9
All	62.7	54.9
Season PR (%)	92.9	91.7

\* DOB = 281 days from AI

*Table 1 - Pregnancy rates and joining dates of a herd during the Cohort 5 and 6 breeding period*

While a reduced pregnancy rate was observed to AI in the Cohort 6 programs, this is in line with the normal year to year variation observed for cows that are  $\geq 3$  years of age. The AI pregnancy rate of the heifers on their first calf was reduced, which is not surprising given the higher prevalence of post-partum anoestrous often observed in this type of females.

Importantly, the end of season pregnancy rate was comparable between Cohorts 5 and 6, which is impressive given that the joining period for this herd only lasted 7 weeks. This herd has clearly demonstrated that synchronisation can be used as an effective tool to shift the time of your calving.

This article not only demonstrates that in a commercially managed beef operation, synchronising cows for FTAI can improve the financial performance of your herd, it also can improve your genetics.

*Adapted from article by Dr Sophia Edwards, Technical Specialist Reproduction, Vetoquinol Australia*

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