



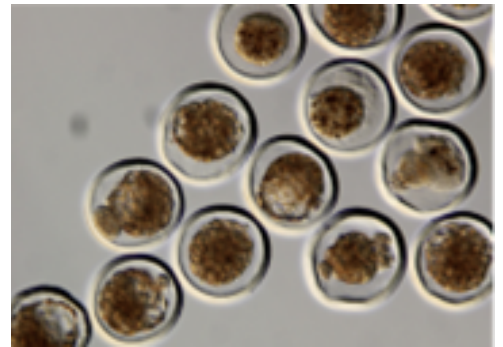
NOVEMBER 23

ADVANCED BREEDING

Embryo Services

Over the last two years the embryo services offered at the George have grown to provide a number of options on farm for improving genetic gain and exploring alternative breeding options.

You may have become familiar these, if involved with donor or repeat breeder programme's already. For those less familiar, this walk through will break down the processes involved and where our embryo services can work in your systems.



The concept of embryo production and transfer has its roots in the pursuit of **high genetic merit**

The process has arisen to allow producers to utilize high genetic value or desirable animals on farm in 2 key steps:

- 1) To extend these genetics into multiple high value calves, rather than a single good calf from a single valuable dam.
- 2) To produce these higher merit calves from lower value animals (recipients) that would otherwise produce less valuable animals from conventional methods.

This gives an opportunity to advance the genetic progression of a herd much faster, with more flexibility and preserve genetic merit over conventional breeding methods (AI/natural mating).

Where to start...getting embryos

The start point for any embryo work is, surprisingly, getting some embryos!

Embryos can be purchased rather than developed on farm; for example well known dam lines can be purchased through embryo sales (for a price!) and repeat breeder embryos are purchased from lower value donors.

However, in most cases the most accessible and economical source of genetics is that on farm. Flushing high value donors is therefore a key start point, and identifying which animals are the best candidates is essential.

We would recommend using **genomic testing** to identify animals that are hold the most value in a herd and those that are **potentially detrimental**. **Heifers** are the priority target as they represent the forefront of a herds genetic progression. As shown on the right, genomic analysis of successive bulling heifer groups reveals far more than simply production associated data; rather giving an insight a wealth of traits such as **lameness, somatic cell counts, metabolic disease risk and feed efficiency** that translates into substantial generational step forwards in terms of replacement performance and health.

An example of a genomic analysis on a heifer group with 4 multi-trait indexes included. These figures represent multiple traits, a discussion would then be had as to which traits are more important for that specific farm (for example, lameness or feed efficiency) that would inform both potential donor and recipient selection.

DWP ↓	MILK	FS	FI	PL
204	-992	-161	-2.6	0.5
606	335	56	0.1	2.9
1,065	1,451	389	2.5	5
1,065	724	101	-0.6	5
1,002	1,093	-159	-1.4	3.1
914	170	46	0.8	4.1
867	1,312	-58	0.6	3.2
830	1,104	59	0.2	3.9
792	627	-42	-1.5	2.7

Identifying suitable donors in this way produces calves with genetic potential for not only production benefits, but an overall more resilient animal less prone to poor health and disease risk. In addition, testing also reveals the most suitable recipients in a group based not just on those that have **potentially detrimental genetics** but on dam fertility parameters that the most fertile recipients to maximise pregnancy rates.

Retrieving embryos essentially consists of 3 steps:

1. Superovulation programme (around 30 days) to ensure the donor produces multiple eggs at fertilization.
2. Embryos are flushed with a sterile embryo friendly solution and collected in a filter. This is all done on farm.
3. Embryos are assessed, graded and then implanted fresh or frozen depending on whether recipients are lined up on the day. Again this process is completed all on farm.



Flushing success rates and implantation success

A commonly asked question is, 'how many pregnancies can I expect to get with an embryo programme?'. An incredible number of factors influence success; cow and recipient health, disease status, superovulation response and compliance with treatments, to name a few. Therefore whilst these programmes are **high reward** they are also **high risk**. An average of 5 grade 1 (the best) embryos per cow is commonly quoted, which means inevitably there will be fruitless attempts. As part of our programmes we rely on thorough discussion, planning and guidance to cover all eventualities, ensuring the best possible outcomes. If you are considering exploring a donor programme, we recommend contacting us ASAP (ideally 6 months before flushing) to discuss the process and donor considerations in more detail to get the best success.

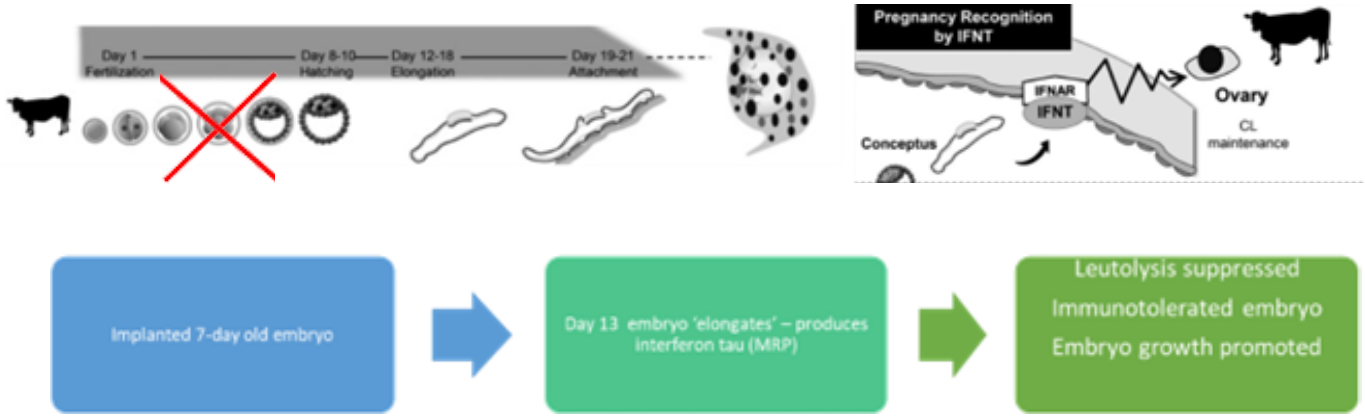
Implantation and Repeat breeder programmes

Embryo transfer is evidently the next crucial step once embryos are ascertained. It is carried out in much the same way as traditional AI, only the embryos are implanted into a non-bulling cow at a set time-period post-bulling by a vet under epidural anaesthesia. Like the donors, there are a multitude of considerations for recipients (such as disease status, condition and nutritional status) that need considering which are best discussed well in advance of lining up recipients for implants.

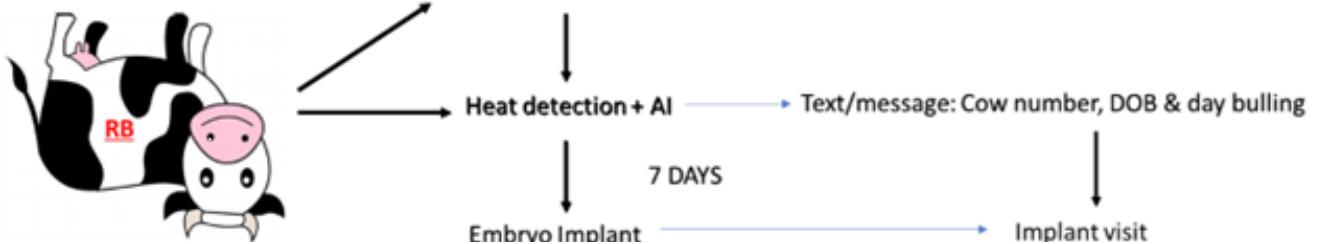
Treatment of problematic repeat breeder cattle is a specific branch of our embryo service. Many repeat breeder cattle fail to establish pregnancies due to early losses (also known as early embryonic loss) which is often due to a disruption in a natural hormone production (INF) that stimulates a signal known as '**maternal recognition of pregnancy**' or MRP. Implanting an embryo can help to boost the signalling of this MRP pathway and increase the chance of establishing a successful pregnancy.

We now routinely produce repeat breeder reports that outline suitable candidates for repeat breeder treatments; **good producing cows, failing to hold to service (> 3 serves) and are at risk of becoming an expensive fertility cull simply because of failure to establish a pregnancy**. Organizing a treatment is simple; when the repeat buller or a synchronised group of RB's comes into heat, serve as normal, let us know, and 7 days we will implant bringing all equipment to farm. An implantation takes <30 minutes in most cases.

MRP failure



Session/RB identified by farmer



Clostridial cases following injections

Recently we have seen a small number of suspect clostridial deaths following injections of various solutions (medicines, vaccinations etc.).

This serves as a timely reminder to be extra vigilant around cleanliness when injecting, ensuring use of clean new needles and syringes, keeping bottle tops sterile and wiping with surgical spirit before use, ensuring injecting on clean areas.



Will Balhatchet
BVSc MRCVS

Vet Tech Update

This month we have had 2 new faces joining the vet tech team: Amy Sheppard and Bethany Davies, who are already out on farm TB testing! They are looking forward to meeting you all.

Our vet techs are busy freezebranding, so if you need any doing book in asap to get the date you want. Also, don't forget to book in your mobility scores over December/January.



Finally....If you'd like one of our calendars please contact the office - they are £10 each and all proceeds will be split between the two charities - The DPJ Foundation and Farming Community Network.