

DAIRY

Advanced breeding techniques such as embryo transfer (ET) can allow producers to make rapid progress in the genetic potential of a herd. However, both donor and recipient need careful management. **Wendy Short** reports.

Achieving successful cow embryo transfer

The use of super-ovulation techniques for the donor cow can result in an average of four to five embryos being produced when a cow is flushed following insemination, says vet Stuart Mullan, of the Cumbria-based Paragon Veterinary Group.

Mr Mullan says there are two main options for managing the resulting embryos. The first is the direct transfer of a fresh embryo to a recipient cow, which will usually have received heat synchronisation treatment. The other alternative is to freeze the embryos, which can be transferred at a later date or sold on.



“There is significant and growing demand for live breeding cattle for export”
STUART MULLAN

Pregnancy rates

The average pregnancy rate for fresh embryos is 65 per cent, while the figure for frozen embryos is about 55 per cent. At least three straws of high quality semen will be needed for each donor.

The success of an ET programme depends on a high standard of management of both the recipient and the donor cow, says Mr Mullan.

“It is a bit like moving up from a family car into the world of Formula One racing,” he says. “Both animals must be in top condition in order to maximise embryo pro-

duction in the donor cow and encourage uptake in the recipient.

“All the basics must be covered, including keeping up with routine vaccinations. Preparation should begin at least eight weeks before starting the programme, as it may take time before some vaccines are fully effective.

“The choice of recipient and its preparation should be discussed with the ET technician and the farm’s own veterinary surgeon.”

Mr Mullan says the diet must cover all the cows’ needs. The right balance of trace elements is one of the main priorities.

“The role of vitamins and min-

erals for fertility and general performance can be undervalued on some farms,” he says.

“Offering free access to minerals or relying on their inclusion in concentrate rations is seldom sufficient. Even herds with acceptable fertility performance will benefit from additional dietary supplementation for best ET results.

“Special attention should be paid to copper to overcome molybdenum toxicity, although it is important not to give too much as it can be toxic.

“Selenium, iodine, zinc, phosphorus and cobalt also have strong links to cattle fertility.

There is wide variation between farms, but in certain cases we will recommend a bolus treatment or a high quality, powdered mineral product for a minimum of six weeks before flushing.”

Cattle which are losing weight are unlikely to respond to super-ovulation treatment. Overweight cattle, especially maiden heifers, are also unsuitable.

Mr Mullan says donor cows should be on a rising plane of nutrition, with special attention paid to energy levels. “Offering sugar beet pulp about a month before the start of the programme can be beneficial,” he says. “For optimum rumen function, they should also be receiving plenty of long fibre, such as straw, silage or hay.

“High levels of concentrate should not be given at any one time, as excess protein has been found to reduce the number of viable embryos produced.”

Donor cows

The donor cow should be less than 10 years old, with no history of infertility or sub-fertility, he says.

“Maiden heifers and older cows will tend to produce fewer embryos, on average. It is advisable to allow donors a ‘settling in’ period of at least four weeks before entering the programme and they should remain in their accommodation, ideally in a small group, until flushing.

“If possible, the stress and change in diet associated with spring turnout and winter housing are periods which should be avoided. If unavoidable, buffer feeding should be considered.”

Another factor to bear in mind is previous calving date.

Mr Mullan says: “Beef breed donors should be at least 10 weeks calved and it is best to wait for 10 to



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Embryo export

■ Paragon Vets has sent cattle embryos produced in the UK to countries including Holland, Sweden, Germany, Australia, the USA and Canada

■ The regulations which apply depend on individual country policy

■ However, embryos can usually be collected on-farm, with processing carried out in an export-licensed mobile laboratory

ET can be used as part of a herd expansion programme, he says.

“Historically, unwanted bull calves born on dairy farms have reduced farm profitability, but sexed semen has been available for many years, with techniques improving all the time. When used in conjunction with ET programmes, a rate of 95 per cent heifer calves should be achievable.”

Breeding techniques

Advanced breeding techniques offer great opportunities for speeding up genetic progress and improving performance, but top quality animals also have the potential for sale in the global marketplace, says Mr Mullan.

“The price of UK cattle is buoyant and there is significant and growing demand for live breeding cattle for export, especially since the introduction of genomics.

“Our beef and dairy cattle, including native and continental breeds, are regarded worldwide.

“Two exciting recent developments are ovum pick-up and in-vitro fertilisation. These allow for even greater acceleration of genetic improvement.”

12 weeks if the donor is a high-yielding dairy cow.

“A post-calving vet check is recommended and the donor should have had two observed heats to make sure it is clean and cycling.

“There is no hard and fast rule on minimum age for heifers as it depends on the breed, but they should be well grown and sexually active before joining the programme. As a rough guide, beef heifers need to be 15-18 months and dairy heifers 13-14 months.”

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