

## **Managing the problem beef embryo donor**

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### **Abstract**

Defining the problem beef embryo donor and the methods of managing each problem can differ with each donor presented. To manage the problems presented to the practitioner the answer may include any one, or a combination of conservative medical or surgical solutions. The donor's life and physical health are rarely at risk when dealing with embryo production issues. Therefore, the treatment protocol should be based on the possibility of increasing her embryo production, and whether the expense involved is justified.

**Keywords:** Problem donor, management, treatment, expense

### **Introduction**

What is a problem donor? The argument can be made for defining the problem donor as that animal with physical or reproductive problems that deny her any possibility of producing viable embryos on the day of embryo collection or one that just gives fewer embryos than the average. In embryo transfer practice the definition of a problem donor is primarily dependent upon the owner of the cow. One owner's definition of a problem donor can be another owner's definition of acceptable. The financial as well as emotional investment is weighed in defining whether or not the individual donor has a problem. If the beef donor is the son's or daughter's present or past show heifer, or if she is the dam of the steer that won a major show, then her status as a problem donor may differ when compared to the embryo donor that is used only to fill an embryo purchase quota. Emotional

involvement and potential windfall gain, as compared to economic returns based on embryo production per collection can drastically alter the definition of the problem donor. The difficulty is to arrive at a definition of the problem beef donor that allows the embryo transfer practitioner to make consistent recommendations for managing a problem while at the same time taking into account the variations of expectations that result from each individual case.

### **Donor Embryo Production**

The average number of viable embryos recovered per collection from stimulated beef donors as reported by the American Embryo Transfer Association (AETA) in 2007 was 6.52.<sup>1</sup> In 2006 embryo production was 6.50<sup>1</sup> and review of the past averages reveals there have not been appreciable changes since the reporting began. This gives a baseline for the discussion with the owner, and allows him or her to make treatment decisions based on the animal's peers.

### **Donor Management Problems**

The problems that are routinely seen in the beef donor that result in less than expected results can be categorized into problems associated with the owner, the practitioner, and those directly related to the animal. The owner's problems can be the easiest or the most difficult to solve. Many times the owner's problem is solved through education. Helping the owner understand what is and is not a problem is crucial. If he/she has been misinformed by breeders, journals, or other sources about expectations of embryo production a quick review of the national averages<sup>1</sup> will resolve the problem. A second owner-related issue that can lead to a donor problem is the use of frozen semen from a sire with poor fertility. The pressure to use the new up-and-coming sire or the bull that sired the high selling lot at the last breed sale may take precedence over possible fertility issues. Even if a history of fertility

problems with the sire in question can be documented the decision to change sire choice to one with good fertility can be a difficult task.

The second group of problems that can negatively affect the donor's production are problems related to the practitioner. The donor problems that can arise from the practitioner range from inexperience, substandard donor protocols, inadequate embryo equipment, handling facilities, weather, and cattle breed and age variations to name a few.

The third category of problems is that linked directly to the animal herself. These decreases in production can be related to age, breed, malnutrition, obesity, disease, lameness, genetic or congenital defects, reproductive disease, trauma, or dystocia.

### **Solutions and Treatments**

To assess and devise a management plan for the many causes of decreased production in the donor requires addressing all three categories of problems.

#### **Owner-related problems**

Owner education is the key to an understanding of embryo transfer goals. It is not always easy for the owner to hear that not all donors give "25 number 1 eggs" at every collection, but it is better to give realistic goals to the owner before the expenses and time required for a successful or non-successful superovulation and collection are incurred. Embryo production can be extremely high but there are many more donors that give no viable embryos in a collection as opposed to those that produce twenty five or more that all grade as quality score one.<sup>2</sup> Sire selection is a difficult decision for the owner. In a superovulation program it should be given considerable attention. With embryo production the practitioner's primary goal, the most consistent sire selection criteria available is to use semen with known collection results. Whenever possible obtain frozen semen that you have

personal experience using in your practice. The same semen from the same cane from the same bull taken from the same ranch nitrogen storage tank is the best way to insure consistent sire results. Keep detailed records on every sire and refer to the results when discussing sire assignments with the owner. He will make the final decision, but your knowledge of previous sire success or failure can be a big influence.

#### Practitioner-related problems

The failure to reach production goals because of mistakes, inexperience, and lack of specific reproductive knowledge by the practitioner is not a minor problem. If the practitioner can not devote a large percentage of their time to embryo work they will not know what equipment is necessary in specific situations, what programming differences are needed related to breed and age, and how to deal with individual animal variations to obtain the maximum production at each collection. The virgin heifer is a good example. She can be a productive embryo producer if managed properly. By monitoring the estrous cycle, decreasing the total amount of FSH, minimizing external stresses, and using specific collection equipment and techniques a practitioner can increase the percentages of success with young heifers. If the virgin heifer is managed as an adult the results will be disappointing. The opposite end of the spectrum is the obese older American breed (Brahman influenced) donor. Finding the proper stimulation protocols, and having the equipment and ability needed to effectively collect this cow type is quite a challenge. There are 1800 pound Beefmaster donors that require less FSH than a virgin heifer, have an extremely large cervix and ovaries that are larger during postpartum anestrous than most bovine superstimulated ovaries. The list of normal variations in the beef donor is lengthy but

the point is, the practitioner must be knowledgeable of the different skills, techniques, and donor requirements needed to handle the variations as they are presented.

#### Animal-related Problems

Many of the donor problems related to the cow can be solved with time. Very commonly a young normal heifer is presented as a potential donor and has not yet reached puberty. A post partum cow or a thin nursing cow is presented and is not yet cycling. These are not true problems but normal occurrences in the cow's life. A group of reproductive problems that can be treated either conservatively or aggressively, depending on the specific problem's effect on embryo production are urine pooling, pneumovagina, and vulvar tears. My approach to this group of problems is conservative as long as no uterine involvement is detected. I have adopted this approach because of the examination of recipient pregnancy records. Notations on the transfer record for each of these three problems were made every time a recipient was presented for transfer and the pregnancy results were examined. The pregnancy rates of those affected recipients with urine pooling, pneumovagina, or vulvar tears, but no indication of uterine involvement, did not differ from the non-affected recipients. The donor with vulvar tears that allow vaginal fecal contamination and the urine poolers that show signs of metritis are surgically repaired. The true problems that affect production are often times problems that cannot be reversed. Blockage of the oviduct (whether cystic or caseated), chronic mucometra, and severe uterine/ovarian adhesions are a few examples. These problems can be handled in one of two ways, either sell the donor or refer her to an in-vitro fertilization (IVF) clinic. The options are discussed with the owner as to the cost of the procedure and expected results. If the value of the donor's offspring warrant the expense then IVF is a good option.

## **Conclusion**

I hope I have made you aware that most of the problem donors that are presented can be managed conservatively with success. The beef cow is one of the most reproductively resilient animals veterinarians will ever encounter. The nutritional, physical, infectious, genetic, and iatrogenic stresses that the cow can withstand and still be reproductively prolific is quite remarkable.

## **References**

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