

American Milking Devon Cattle Association
Member Survey Concerning
Embryo Transfer

Introduction

As you know, the membership voted at the May Annual Meeting to place a one year moratorium on the registration of animals resulting from embryo transfer. The Directors are working to develop a recommended policy on this subject for presentation to the 2008 Annual Meeting. This survey and the accompanying background information are intended to solicit your input to this process.

Please read the attached background statement carefully, think about it and complete the short survey below. Although we have provided some specific choices we are especially interested in your amplifying comments: i.e. "Why you feel the way you do about ET". Please complete and return the survey to William C. Blaiklock, Secretary AMDCA, 388 Arrowsic Rd, Arrowsic ME 04530 by September 30. If you have technical questions please contact Drew Conroy at (207) 698-4651 <OxwoodFarm@aol.com>. Thanks for your assistance.

Survey

Please check the alternative that most closely matches your preferred policy on embryo transfer. Use the space below to expand on the reasons for your choice, or to describe another alternative. These alternatives are conceptual; tell us what they mean to you.

- No restrictions – register all embryo transfer (ET) animals originating from registered American Milking Devon stock, subject only to DNA testing and other registration procedures intended to safe guard the integrity of the Registry.
- Restricted use – in order to maintain genetic diversity, limit the total number of ET registrations from any single sire and/or dam.
- Prohibit ET - in order to maintain genetic diversity, prohibit ET altogether.
- None of the above; I prefer the alternative I have described below .

Comments (Please continue over leaf)

About You

- How many years have you owned American Milking Devon cattle? _____
- How many American Milking Devon cattle do you currently own? _____

Signature (optional) _____ Date: _____

American Milking Devon Cattle Association's Background Information in conjunction with a member survey on Embryo Transfer (ET) policies and procedures.

By Drew Conroy, AMDCA President
June 29, 2007

Many breed associations similar in size to our have struggled with this very issue.

My comments below are not meant to be persuasive, but rather provide some background information on the use of Embryo Transfer and both positive attributes and areas of concern. Personally, I would like to see us allow Embryo Transfer, but do it in a way that ensures the embryos are what they are supposed to be.

For a more comprehensive overview of the technology, I would recommend reading Training Manual for Embryo Transfer in Cattle, by George E. Seidel, Jr. and Sarah Moore Seidel, of the Animal Reproduction Laboratory, Colorado State University, Fort Collins, CO 80523, USA. Published by the Food and Agriculture Organization of the United Nations, as FAO ANIMAL PRODUCTION AND HEALTH PAPER 77, which can be viewed at <http://www.fao.org/docrep/004/T0117E/T0117E00.HTM>

Thoughts from:

Don Bixby, of the American Livestock Breeds Conservancy would not recommend that we disallow this practice. In fact, he stated, *"If we are allowing Artificial Insemination, there is a much greater chance of concentrating the gene pool, through the fact that we have not drawn many bulls, and the semen is readily accessible to many members due to its low cost."*

Phil Sponenberg explained, *"Embryo transfer is 'value neutral' really, but can have a VERY bad downside in rare breeds of narrowing genetic variation on the female side of the equation. So, it is best if recipients are not purebred cows. And, likely it is best to limit the numbers produced by an individual cow in any one year. I'd do the same on the bull side, too, though."*

Don Bixby has nothing against strong policies restricting its use, but he warned that this is not easy to do or get consensus on a policy within a breed association.

The North American Devon Cattle Association has already interpreted our one year moratorium as a ban on ET, and perceived our survey of the membership to be in some way construed to be "small in our thinking". Interesting reading and the author's misinformation and opinions are quite malicious for an association trying to lure AMDCA members to join their association. see: <http://www.northamericandevon.com/info.html#AMDA>. It is one of the highlighted items, on June 14th, the fourth item down from the top.

Advantages of Embryo Transfer Technology for a breed such as the American Milking Devon:

There is little doubt that with small numbers of animals, as we have in this breed, if you are trying to expand animal numbers, this can allow more rapid expansion. Our goal is to expand animal numbers. Hopefully we can work so our breed is moved from critical to at least threatened, and maybe Watch or Recovering status. We have not had a lot of growth in animal numbers, and engaging technology will provide one tool to grow animal numbers.

Also on the positive side the sale of embryos could allow breeders in remote areas to have easier and cheaper access to American Milking Devon Cattle, particularly the female side of the gene pool. The end result could be that people in areas where there are few of our cattle, could more easily access the genetics and start their own herd.

Embryo's can be shipped and moved much easier than live cattle. Embryos can be shipped as easily as straws of semen.

More purebred cows and bulls on the ground would allow for more selection based on traits individual breeders desire, and might allow culling of genetically inferior animals, which I do not believe is happening at all, with the current high prices.

Concerns in using Embryo Transfer include:

If a few cows are used, and those cows generate a large number of embryos you can create a genetic bottleneck. However, the same thing is true for the use of semen, and even more so, as it is a lot less costly than embryo transfer, which means more people will likely adopt (or have already adopted) Artificial Insemination versus Embryo Transfer.

In the last few years we have had a few people buying up a number of animals, which resulted in higher average prices for Milking Devon Cattle than we have seen in the past. This rise in prices has been welcomed by many, including myself. However, this is a clear example, of how a few people can affect a breed with small numbers of animals, in a short period of time.

There may be some need for disclosure that the cows were flushed. For genetic reasons, we would want buyers to know that a cow purchased after flushing may have a greater than normal number of offspring in the population.

There are also some concerns about the reproductive status of the animals after being used as flush cows. I could find no data saying that cows that are flushed are routinely less fertile, but in the process of flushing, there is the chance of damage to the reproductive tract, and the flush cows becoming overweight (as dry donor cows), which often leads to difficulty breeding. This happens in cattle left open for long periods that have not been flushed.

Recommendations, if members decide to support Embryo Transfer.

There is a real need for documentation that the embryos in straws are what they are supposed to be. The American Embryo Transfer Association has clear rules for documenting the collection of

embryos, as well as protocols for the identification and sale of embryos: view their website on the Internet at <http://www.aeta.org/> for more information. They defer to breed associations about individual rules on genetic testing and so forth.

Genetic testing of the sire and dam are required by many associations and the Dexter Cattle Association and other Dairy Breed Associations require the DNA testing of offspring resulting from ET.

If the embryos are not going to be immediately implanted into recipient cows that the owner of the flushed cow controls, the information necessary for documentation on the embryo for later registration should also include:

On the container of frozen embryos:

- identification of the organization that processed the embryos
- breed of embryo
- identification of the dam (sire optional)
- date on which the embryos were frozen
- identification number for the container
- number and stages of embryos in the container

On the goblets and canes:

- cane and goblet numbers
- identification of the organization that processed the embryos
- date of cryopreservation
- identification of dam and sire
- breed
- number of embryos
- kind of packaging/indication of repackaging

****The above recommendations come from Seidel and Seidel, Food and Agriculture Organization of the United Nations, FAO ANIMAL PRODUCTION AND HEALTH PAPER 77, Chapter 16, Records. as cited in the references.*

Given the above information, it would seem that at a minimum the association should likely require an embryo recovery certificate, which may also include:

- a) an embryo evaluation
- b) the date of cryopreservation or freezing of embryos, particularly if the resulting embryos are for sale.
- c) There may also be a need for embryo transfer documentation, if recipient cows are sold carrying embryos.

There is also a need for ~~similar testing for embryos as required by bulls for diseases prior to drawing semen, there is a similar need for~~ health testing of cows used as donors, according to National Association of Animal Breeder standards. This will ensure that the embryos meet the requirements for international sale and shipping, plus provide an assurance of health of the embryos to the buyers.

Summary

In the case of small populations every animal counts and there can be a benefit realized from Embryo Transfer, but it is not the cure for a small population, as genetic diversity is important as well as animal numbers. There is the possibility of imposing restrictions on the number of calves from each cow that could be registered, as a way to minimize the possible effect that one cow has on the population, but again, this limitation would be similar to limiting the number of offspring allowed from a bull who has been drawn and used for artificial insemination, which the association has not ever addressed.

One of the problems with selection of traits such as for milk production within a breed, is that the real value of the breed may lie in other characteristics that might be lost if there is increased specialty selection. At this time we have no verifiable production information on milk production or progeny tests on bulls, so selection will not likely be as intensive as it might be in other breeds. In any case, embryo transfer would allow possible inferior animals (for certain traits) to be propagated at a rapid pace, possibly displacing other more genetically superior animals for the same traits.

Finally, the other challenge is that breeders with the best intentions may not get a cow that flushes well, despite the cost and efforts to do so.

References:

Phone Interview with Don Bixby, DVM, – Technical Program Manager, American Livestock Breeds Conservancy (ALBC), Pittsboro, North Carolina – Monday, June 11, 2007

Phone Interview with Marjorie Bender – Research and Technical Director, American Livestock Breeds Conservancy (ALBC), Pittsboro, North Carolina – Monday, June 11, 2007

Phone Interview with Jeannette Beranger – ALBC Research and Technical Program Manager American Livestock Breeds Conservancy (ALBC), Pittsboro, North Carolina – Monday, June 11, 2007

Email Message from D. Phillip Sponenberg, DVM, PhD, Professor of Pathology and Genetics Department of Biomedical Sciences, Virginia-Maryland Regional College of Veterinary Medicine, Virginia Tech, Blacksburg, VA. June 20, 2007.

George E. Seidel, Jr. and Sarah Moore Seidel, of the Animal Reproduction Laboratory,

Colorado State University, Fort Collins, CO 80523, USA. [Training Manual for Embryo Transfer in Cattle](http://www.fao.org/docrep/004/T0117E/T0117E00.HTM). FAO ANIMAL PRODUCTION AND HEALTH PAPER 77, Viewed on the Internet June 13 2007 at: <http://www.fao.org/docrep/004/T0117E/T0117E00.HTM>

*******ADVANCE NOTICE*******

AMDCA will host a membership gathering in connection with the ALBC Annual Conference to be held in Sanford, North Carolina, November 2-4, 2007. We will be discussing and many topics of interest to American Milking Devon breeders, including embryo transplant. Save the date, details later.