



DAIRY CATTLE REPRODUCTION COUNCIL

## Roundtable: How Ultrasound Has Impacted Reproduction

Technology continues to revolutionize the way tasks are completed on the dairy, including our ability to get cows bred. One tool that has grown in use is ultrasound. To better understand how veterinarians are using ultrasound to make effective reproductive decisions, we have asked two veterinarians about their experiences with the technology, and what the future holds for advancements in reproduction.

### How did you begin using ultrasound? Why did you first incorporate this technology into your practice?

**Colloton:** When my partner and I purchased our first ultrasound unit in 1997 we had no idea if we could learn to use it or if our clients would want it. We realized the limitations of palpation and hoped this “new” technology would be good for our clients. At the time we had Brad Stroud’s excellent training videos (“Bovine Reproductive Ultrasonography” and “Fetal Sexing Unedited” published by Biotech Productions), but very little hands-on training was available. Thankfully, our clients were enthusiastic and willing to lend us cows for practice.

**Dorshorst:** My first experience with ultrasound began approximately 10 years ago when my dad was trained to use ultrasound and had someone work with him in our herd. That same individual provided training and mentorship to me. I feel that I was fortunate on several levels regarding my assimilation to ultrasound. I was able to work within my own herd to develop my skills absent the pressure of the client looking over my shoulder. I was also fortunate that, although I had artificially inseminated cattle for many years previously, I had not become dependent on manual palpation for pregnancy detection. Therefore, I was able to easily force myself to become proficient in the absence of manual palpation as a “crutch.”

### How has your work with ultrasound evolved?

**Colloton:** Since day one I haven’t stopped learning and becoming more proficient. Studying research, talking to other veterinarians, and scanning thousands of cows has made ultrasound fun. There’s always something new to learn and apply to practice.

**Dorshorst:** Initially, it was related specifically to pregnancy detection and fetal sexing. Lately, I have added *in vitro* fertilization to the list of ultrasound-facilitated reproductive tools that I use. Occasionally, I will ultrasound a suspicious umbilicus or other defect. Now I find myself doing some teaching and consulting in other countries for embryo transfer and find the ultrasound is a powerful tool for validation of the process when dealing with a skeptical audience and it is also an excellent teaching tool.



*Dr. Jill Colloton* completed her DVM at the University of Illinois in 1988 and joined a mixed practice in central Wisconsin shortly after. Since 2000 she has owned and operated Bovine Services, LLC, providing ultrasound services to dairy producers and training courses to veterinarians.



*Dr. Matthew Dorshorst* is based in Central Wisconsin, where he owns a veterinary practice with his father and manages a family dairy farm composed of registered Holsteins. The veterinary practice focuses on aspects of reproduction including reproductive ultrasound, embryo transfer and export, as well as *in vitro* fertilization.



DAIRY CATTLE REPRODUCTION COUNCIL

### **In what ways is ultrasound incorporated into the reproduction programs of your clients' operations?**

**Colloton:** Most of my clients want the following from ultrasound, in order of importance:

- Accurate and early pregnancy/open diagnosis
- Assessment of fetal viability
- Twin diagnosis
- Ovarian assessment for synchronization protocols and embryo transfer
- Fetal sexing for cull and sale decisions
- Diagnosis of pathology

**Dorshorst:** I have a wide spectrum of clients. Some prefer to manage reproduction very intensely and have realized that it can become an important part of minimizing hormone use and targeting your reproductive protocols accordingly. Others prefer the advantage from a merchandising and management standpoint. They can gain value on an unborn fetus or manage the culling and calving within their herds based on the diagnosis of the sex of the pregnancy. I have some producers who are only interested in knowing whether a cow has twins so they can make appropriate management decisions for that situation.

### **What information from ultrasound can be used to further a dairy's reproduction program?**

**Colloton:** Earlier pregnancy/open examinations get open cows back into the breeding pool sooner. Ultrasound can also identify dead embryos or fetuses, allowing those cows to be treated and bred back more quickly. Twin diagnosis helps clients manage those cows differently, perhaps with early dry-off and more careful attention to body score condition. Ultrasound is far more sensitive for detecting luteal tissue than palpation, which is helpful for choosing appropriate synchronization protocols, evaluating compliance and selecting embryo recipients. When the relative value of bull and heifer calves is very different, fetal gender may decide whether a marginal cow is kept or culled.

**Dorshorst:** As I alluded to earlier, the establishment of early pregnancy diagnosis and fetal viability are real advantages. Also are the advantages of diagnosing cows with twins and the fetal sex determination. I think one unrealized benefit of ultrasound is the ability to minimize the use of hormones on a dairy. Many places would prefer to "Shot Gun" their reproductive strategy by using PreSynch programs and others. By checking cows prior to enrollment in various reproductive protocols we can increase the efficiency of these hormones as well as minimize their use. In a society that is ever increasing its level of concern regarding hormone use this is no small detail.

### **What type of consultative discussions have occurred following the use of ultrasound technology?**

**Colloton:** Because most of my dairy clients have very healthy cows and little uterine pathology, we use ultrasound primarily to quickly identify reduced pregnancy rates and synchronization compliance problems. For example, for clients using PreSynch we may examine cows the day the first GnRH is to be given. Since those cows have already received two set-up doses of prostaglandin, most cows should have a good CL. If there are a high percentage of cows without a CL we know there is either a cow health or compliance problem that needs to be addressed. Because first pregnancy examinations on synchronized herds occur 32 – 34 days after breeding, we can use a similar assessment for cows diagnosed open after later inseminations.

We also carefully track embryonic and fetal loss between the first pregnancy examination at about 32 days and the recheck at approximately 60 days. An increased rate of loss alerts us to possible disease or nutrition issues.



## DAIRY CATTLE REPRODUCTION COUNCIL

**Dorshorst:** Discussions related to diagnosis made by ultrasound have usually been requests for further information on how to manage a situation or improve a problem that was recognized by ultrasound. Some of the more interesting discussions have been regarding early embryonic death rates, congenital defect recognition and management, minimization of hormone use, and twinning-related concerns and management options.

**What challenges do you face utilizing ultrasound? How have you overcome challenges in the past with the technology?**

**Colloton:** For me ultrasound is physically easier and faster than palpation. Years ago the challenge was using a big machine on a cart; now all the bovine machines are quite small and wearable.

**Dorshorst:** Initially, it was justifying the expense of the procedure compared to other methods of reproductive management. Once they realized the efficiency and speed with which a veterinarian can use ultrasound the cost became more palatable for producers. Once that issue was resolved it has become an easy tool to justify because the producer recognizes the management options and advantages that ultrasound affords them. Now my clients are my best form of advertisement.

**Ultrasound has become a technology utilized frequently on the dairy for reproductive performance. What other technology do you see on the horizon that would offer the same concept—new ways to gather important information in a time-efficient manner—to veterinarians?**

**Colloton:** Pregnancy blood tests compete very well with palpation, but can't come close to providing as much information as ultrasound. Research in color Doppler ultrasound is showing promise for more accurately staging the estrous cycle. Ultrasound is also now being used for evaluating many medical and surgical diseases of cattle. The technology is reasonably priced, there are great opportunities for training and machines are highly portable.

**Dorshorst:** The sky seems to be the limit here. Whether it is data management or genomic predictions of reproductive and health performance, the opportunities are limitless. I have often commented that my colleagues and I need to evolve with the new technology that has made itself available because, from our perspective, it has given us tremendous business opportunities and allowed us to better serve our clients. It would be easy to become complacent with the information and technology that brought us this far, and I will have to force myself to adapt to the new opportunities that come along so that my producers and I are not left behind.