BREEDING SOUNDNESS EXAMINATION OF THE FEMALE CAMELID

Toni Cotton, DVM
Camelid Reproduction Center of the Western Slope

One of the very best things that a veterinarian can offer their clients is providing the service of Breeding Soundness Examinations or pre-breeding exams. BSE examinations are indicated in both primiparous and multiparous females. It is best to develop a protocol for your exam and stick to it. I have a reproductive exam form that I fill out at the time of the exam which provides a documentation of the female’s current reproductive status. I found that having these forms printed on duplicate or triplicate paper is very helpful as you can hand the client a copy and send one to the referring DVM or the breeding farm for their records. By following the protocol on the form, you conduct each exam in the same order each time. I have always included a physical exam and body condition score as part of the reproductive exam because there are many conditions that are picked up on the physical that may or may not affect the reproductive soundness of the female. Any abnormalities or conditions found that may require medical treatment should be documented.

Camelids have a bicornuate uterus with a single cervix. The cervix has 2-3 spiral shaped cervical rings. The uterus resembles a “Y” in appearance. In an alpaca, the body of the uterus is approximately 3 cm in diameter and 3 cm long and the uterine horns are 8 cm in length. In a llama, the uterine horns are 10-15 cm in length and 3-4 cm in diameter.

Once the physical condition of the animal is assessed, the breeding soundness exam is performed. The first part of the BSE is to perform a vaginal exam. The vulva of the female is cleaned with a mild detergent and dried. In a primiparous alpaca, this exam is normally performed with a sterile glove, using your index finger to check the size of the vaginal opening. It is normally not possible to pass a speculum into a primiparous (maiden) alpaca. In a normal maiden, it is common that you can only pass your index finger to the level of your distal phalange joint. A “normal” vaginal opening in a maiden alpaca is only as large as the tip of your index finger. If there is no opening in the vaginal cavity at the time of the exam, then the female has a complete hymen. If a complete hymen is diagnosed on the exam, and the female is less than 24 months of age, it is normally best to wait until she is two years of age to recheck her. In the majority of cases, the hymen will be gone by age two. If it is not, care must be taken when breaking it down to prevent scarring and trauma to the vaginal cavity. Prior to breaking down the hymen, a second ultrasound examination should be performed to be sure that the reproductive tract is “normal”. I have seen cases in which these females are segmental aplasia cases and the suspected “hymen” is a thick wall of tissue.

In a maiden llama, the vaginal exam is performed using a vaginal speculum. The vaginal speculum that is most commonly used in camelid reproductive medicine is the disposable sigmoidoscope made by Welch Allyn. There is a light source that fits the end of the speculum and a smaller attachment that allows the light source to fit onto a 3.5 v rechargeable handle.

I have listed the equipment that I use at the end of this paper for your reference. It is very important to use the proper equipment and light source to allow complete visualization of the cervix and vaginal cavity. Any abnormalities are noted on the exam form. The most common cervical abnormalities found are cervical or vaginal tears and scarring or cervical inflammation.
and discharge. It is also important to note if the cervix is open or closed and if open, is it open enough to pass a culture swab and a flushing device? If a female is cycling normally, her cervix will change in response to the hormonal influence of the ovarian wave cycle. As her estradiol levels increase with follicular growth, the cervix will open and become spiral in appearance and tilt cranially when maximally open and then as the follicle regresses, the cervix will become more circular in appearance and protrude caudally. Even if the cervix appears normal and is free of discharge, this is not an indication that the female does not have a uterine infection. For this reason, it is imperative to perform an ultrasound exam as part of the reproductive exam. I normally complete the ultrasound exam prior to performing any invasive procedure such as a uterine culture or uterine flush. I do this because I have found several of the infertile females to be pregnant on ultrasound exam.

The ultrasound identifies the reproductive tract and is useful to identify any abnormalities as well as to check for follicular activity on the ovaries. The ultrasound exam is performed transrectally. Care must be taken to use adequate lubrication and restraint. The desired amount of ultrasound lube should be inserted into the rectum using a catheter tip syringe. I normally use 35-60 cc of the lubrication. There is no need to manually evacuate the fecal material from the female prior to performing a transrectal ultrasound. There are two types of ultrasound probes that are used for this procedure. I have used the 7.5 megahertz prostate probe with the Aloka 500 ultrasound machine for years. There are both advantages and disadvantages to this type of probe. It is more difficult to “trap” the ovary with this probe but with diligence and practice, one can become quite skilled with this probe. The probe provides excellent imaging of the ovaries and the uterus. The main advantages to the prostate probe are that the probe is small in diameter, smooth and the same diameter the entire length of the probe. This is most important if a female moves and the probe has to be removed quickly. There is minimal risk to the female when removing the prostate probe quickly as there is no “drag” or friction on the intestinal mucousa. The other option for transrectal ultrasound is to use an extension handle with a routine hand held probe. This allows you to use the probe transabdominally as well as internally. The main advantage to this set up is that the same probe can be used for either exam. I used an extension handle for three months when trying a new machine and found it more difficult to perform reproductive exams and extremely difficult to remove the probe when needed when the female moved. There is more risk of injury to the female when an extension handle is used and for this reason, I have continued to use the prostate probe.

When doing the ultrasound exam of the uterus, it is important to identify the entire structure. The uterus is found just in front of the bladder. If the female has a full bladder, the uterus may be displaced dorsally and located on top of the bladder. Look for both uterine horns and identify any abnormalities. A uterus that has infection will typically have multiple areas of mixed echogenicity. There are often times “pinpoint” areas of hyperechogenicity and dilated uterine vessels. There may or may not be free fluid in the uterus. There are many abnormalities which can be identified in addition to uterine infections such as endometrial cysts, mucometria secondary to scarring or segmental aplasia or uterine masses. If the female is at least 90 days pregnant or has had a retained corpus luteum for a minimum of 90 days, the cervical rings can easily be identified via ultrasound. The cervical rings become hyperechoic.

Once the uterus is examined, it is important to identify the ovaries. The left ovary is often located cranial to the uterus or in front of the bladder. If it is not located cranial to the uterus,
direct the probe cranial and ventro-lateral to the tip of the left horn. To locate the right ovary, you must follow the uterine horn and the ovary is cranio-lateral and often ventral to the tip of the horn. The right ovary is often cranial to the tip of the right horn and the probe must be directed laterally to trap the ovary. Patience and persistence is needed to become proficient at identifying alpaca ovaries. The more pre-breeding exams that you perform for your clients, the more proficient you will become. The most common ovarian abnormalities are ovarian hypoplasia, stagnant follicles, follicular cysts, ovarian cysts, retained corpus lutea and immature ovaries. It is important to identify any problems that would contribute to a female’s reproductive behavior which must be addressed and treated.

If the veterinarian is unable to identify the ovaries on ultrasound, it is possible to determine follicular activity by measuring the estradiol level on a weekly basis. Estradiol is produced by the granulosa cells of the ovarian follicles. The estradiol level normally increases when the dominant ovarian follicle is growing. If the estradiol level reaches 18-20 pg/ml at any time during the 21 day period, the female should be mature enough to enter into the breeding program. It is best to run a baseline progesterone level as well. It is not uncommon that a female alpaca that is sexually mature will spontaneously ovulate and have a retained corpus luteum on her ovary. If the progesterone level is close to 1.0 ng/ml this is indicative of the presence of a corpus luteum. In this case, the female alpaca should have an ultrasound exam to determine that she is in fact not pregnant and if open, treated appropriately for the retained CL.

**WA Order Numbers for Vaginal Speculum and Light Source**

- WA Fiber Optic Light Head WA36019
- WA Handle Adapter 3.5v WA73500
- WA Handle Rechargeable 3.5v WA71000A
- WA Sigmoidoscope Disp. Box of 25 WA53130
References:

