

Breeding Soundness Examination of the Mare

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A broodmare needs to be a reliable producer of viable foals. This can only be achieved if she has regular ovulatory estrous cycles, breed, conceive, maintain the pregnancy, give birth, and rear the foal. A breeding soundness examination is a reproductive and medical assessment in this regard. The examination may be requested as a pre-purchase assessment for future performance, or for a mare with a history of reproductive problems. Regardless of the reason for breeding soundness examination, the aim of the examination is to determine if the mare has defects that potentially may prevent the mare from conceiving, maintaining the pregnancy to term, safely deliver the foal, and to nurse it to a healthy viable foal. The examination consists of:

1. identification
2. reproductive and medical history
3. a general and physical examination
4. a detailed examination of the reproductive organs.

In addition, specialized examinations such as blood hormone profiles, chromosomal testing (karyotyping), and genetic testing for hereditary diseases and defects may be performed.

1. Identification: An accurate identification includes detailed information on age, color, markings, permanent scars, brands, and tattoos, as well as a drawing or photography of the mare.

2. History: A complete history should be obtained on the mare's general medical

history, past use, and detailed reproductive history.

3. General physical examination: A physical examination should include body temperature, heart rate, heart and lung auscultation, respiratory rate, status of mucous membranes, teeth, eyes, digestive tract, superficial lymph nodes, and observation of any signs that can cause lameness. Possible hereditary defects such as "parrot mouth" and certain limb abnormalities should be noted. In addition, any defect that may interfere with the mare's reproductive performance such as asymmetry of the pelvis should be noted.

4. Reproductive examination: The extent of the reproductive examination is dependent on the reproductive history of the mare, and the purpose of the examination. The following examination is the base of a BSE, and could be expanded on in individual cases.

a. Perineal inspection: Poor perineal conformation predispose to "air sucking", fecal bacterial contamination, and pooling of urine in the vagina. In order to avoid this, the position of the vulva should be close to vertical and approximately $\frac{3}{4}$ of its length should be below the floor of the pelvis. The vagina is further protected from contamination by a circular sphincter (vestibule-vaginal fold) just inside the urethra. The competency of this sphincter can be assessed by manually parting the lips of the vulva. The sound of aspiration of air into the vagina suggests that the sphincter is compromised, and the mare may need surgical correction for this problem. Other

findings of importance to breeding soundness are lacerations, scarring, tumors, and herpes virus lesions on the lips of the vulva.

b. Rectal palpation and ultrasonography: The cervix is assessed for tone and any abnormalities. The uterus is assessed for tone, presence of edema, fluid accumulation, pregnancy, and the presence of cysts. The ovaries are examined for the presence of follicles, ovulations (corpus luteum or CL), and the presence of abnormal structures such as cysts or tumors. Findings on the cervix, uterus, and ovaries are characteristic of different stages of the estrous cycle. For example, a mare in heat should have a relaxed cervix, uterine edema, and a large follicle without any CL present. A disagreement between cervical, uterine, and ovarian findings suggests a reproductive abnormality. The pelvis should be assessed for signs of old fractures that could interfere with a safe foaling.

If the mare is pregnant, normal development of the fetus and the placenta should be assessed. The presence of heart beat, fetal activity, and appearance of fetal fluids are indicators of fetal viability and well-being.

c. Speculum examination of the vagina: Following thorough cleansing of the perineal region, a speculum should be passed into the vagina. During passage of the speculum, the competence of the vestibule-vaginal fold can be further assessed. When passed all the way into the cervix, the speculum should be in a horizontal position, or tilted slightly up. If the speculum is tilted down, it indicates an abnormal slope of the vagina which may predispose for pooling of urine and accumulation of fluid into the uterus. The vagina is assessed for color, moistness, the

presence abnormal discharge, and varicose veins. The cervix is assessed for position, degree of relaxation, color, moistness, and laceration, scarring, or adhesions. If an abnormal discharge is present, a bacterial sample should be taken for identification of the cause of this abnormality. If indicated, the operator may insert a gloved hand in the vagina to further assess the competency and integrity of the cervix.

d. Uterine culture and cytology: Uterine culture and cytology is obtained to determine if the mare is suffering from a uterine infection. It is important to obtain, process, and evaluate the sample correctly in order for the culture to provide valuable information about the mare's reproductive health. If a uterine culture is obtained by the use of a swab sample, it should be taken when the mare is in heat. False-negative culture results may occur when samples are obtained in mares out of heat. Uterine cultures from mares that are out of heat can be obtained from biopsy tissue samples. The danger of misdiagnosing an infection based on the growth of a sample contaminant should be recognized, and the culture results should always be performed and interpreted in conjunction with a cytology sample. The cytology sample is obtained from the same swab, or a second swab sample. Bacterial growth in the presence of inflammatory cells is strongly suggesting a uterine infection. In contrast, bacterial growth without any inflammatory cells does most likely reflect contamination of the sample. The presence of inflammatory cells without bacterial growth indicates a non-infectious cause of inflammation such as urine pooling.

e. Uterine biopsy: A microscopic examination of a tissue sample from the uterine lining provides a valuable piece of information in evaluating the condition of the uterus. The biopsy sample can be

obtained at any stage of the cycle and is very harmless to the mare. A biopsy instrument is inserted through the cervix into the uterus and a small piece of the endometrial lining is collected. The biopsy needs to be prepared and stained in a laboratory before it can be evaluated. Interpretation of the biopsy is based on inflammatory and degenerative changes. The presence of inflammatory cells, the health and activity of uterine glands, and the health of the lymphatics are all evaluated and form the basis for a scoring system into four biopsy categories (1, 2a, 2b,

and 3). The uterine biopsy grading system can be translated to the mare's chance to conceive and carry a foal to term.

The breeding soundness examination will identify abnormalities that can affect the mare's fertility. It does not consider other factors such as the fertility of the stallion to which the mare is bred, heat detection, nutrition, and management of the mare. These factors may be equally important in optimizing a mare's fertility.