Breeding Soundness Examination of Bulls

Overview

**History and physical examination.** The bull should be carefully observed for any structural or physical defects that might interfere with natural mating. Conditions that should be noted include defects in vision, foot and leg problems preventing normal locomotion, and the general abnormalities that may adversely alter spermatogenesis. A detailed examination of the reproductive organs will permit detection of abnormalities of the accessory glands, testis, scrotum, prepuce, or penis. All findings should be noted on the report.

**Scrotal Circumference.** Positive correlations between scrotal circumference and semen production, and negative correlations between scrotal circumference and age at puberty, have been demonstrated in young sires. A mild positive correlation has been reported between scrotal circumference and proportion of sperm with normal morphology. Measurement of scrotal circumference should be done by experienced personnel. Optimum value is realized from these measurements when they are accurately collected in young bulls of known age, weight, and condition. Measurements are routinely reported in millimeters or centimeters.

**Semen Collection and Evaluation.** Semen samples can be collected by rectal massage, the use of an artificial vagina, or by electro-ejaculation. The last method is most commonly utilized and should be conducted with good restraint and minimal stress to the animal. This is accomplished in the majority of cases with experienced personnel and modern equipment.

A properly conducted semen evaluation provides important information relative to a bull's breeding potential. Accurate and repeatable results are highly dependent on the collection and handling of a quality sample of semen. Adverse effects on quality are often the result of sample contamination by water, urine, or preputial fluid or by a failure to maintain optimum temperature of the ejaculate between collection and evaluation. Adequate penile extension during electro-ejaculation will reduce contamination of semen with preputial fluid.

The most important information obtained from semen evaluation is the assessment of sperm viability and morphology. Additional information may be obtained by observation of a properly collected sample for abnormal cellular material, such as from an inflammatory process involving the reproductive tract. Although prediction of the degree of fertility is not possible from a semen evaluation, it does provide reliable indicators of future performance based on seminal characteristics.

**Classification of Bulls.** Bulls are classified into three possible outcomes following the breeding soundness evaluation. The **Satisfactory** category is used for bulls that meet or surpass the minimum recommended thresholds for scrotal circumference, sperm motility, and sperm morphology, and which have no abnormal physical traits or reasons that could compromise their breeding performance. **Unsatisfactory** bulls are those that fail to meet the recommended thresholds in one or more traits and are unlikely to ever improve their status. This category also would include bulls with genetic defects or irreparable problems that would compromise their use as a breeding animal. (continued on last page)
Morphologic Defects

- Pyriform Head & Proximal Droplet
- Irregular Midpiece
- Cratered Head & Proximal Droplet
- Tightly Coiled Tail
- Coiled Tail & Midpiece
- Reverse Tail
- Reverse Midpiece
- Distal Droplet
- Double Midpiece
- Separated Head
The last classification **Deferred**, describes any bull that does not fit into the previously defined categories. This classification is recommended for bulls that are immature or suffering from a transient problem that prevents a satisfactory classification at the time of examination but indicates the bull is likely to improve with age or convalescent time. This category is also utilized for bulls that could not be accurately classified because of problems in collection and for bulls that nearly meet the standard thresholds but may be in below average condition or demonstrate seminal characteristics that may improve at subsequent collection dates.

**The breeding soundness evaluation report.** A proper breeding soundness evaluation should be followed by a completed report defining the following information for future use and documentation of the evaluation:

- Owner's name, address, and location
- The date of evaluation, and identification of any repeat evaluations
- Unique permanent animal identification, breed, age, and alternate identification
- Animal history, weight, condition score, and results of previous tests
- Results of physical examination with explanation of findings if necessary
- Results of scrotal circumference measurements
- Results of semen motility estimate
- Results of semen morphology (percent normal cells if **Satisfactory** or specific morphologic defect(s) resulting in **Deferred** or **Unsatisfactory** status)
- Signature and address of veterinarian or person performing the evaluation.

**Classification Guidelines**

**Physical Examination**

**Minimum Recommended Scrotal Circumference for Bulls Fed Rations Permitting Reasonable Growth**

<table>
<thead>
<tr>
<th>Age (months)</th>
<th>Scrotal Circumference (cm)</th>
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<tbody>
<tr>
<td>≤ 15</td>
<td>30</td>
</tr>
<tr>
<td>15 to 18</td>
<td>31</td>
</tr>
<tr>
<td>18 to 21</td>
<td>32</td>
</tr>
<tr>
<td>21 to 24</td>
<td>33</td>
</tr>
<tr>
<td>&gt; 24</td>
<td>34</td>
</tr>
</tbody>
</table>

**Motility Classification, Utilizing Individual or Mass Motility Estimates**

<table>
<thead>
<tr>
<th>Gross Motility</th>
<th>Percent Progressive Motility</th>
<th>Rating</th>
</tr>
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<tbody>
<tr>
<td>Rapid Swirling</td>
<td>≥ 70 %</td>
<td>Very Good (VG)</td>
</tr>
<tr>
<td>Slower Swirling</td>
<td>50 - 70 %</td>
<td>Good (G)</td>
</tr>
<tr>
<td>Generalized Oscillation</td>
<td>30 - 49 %</td>
<td>Fair (F)</td>
</tr>
<tr>
<td>Sporadic Oscillation</td>
<td>&lt; 30 %</td>
<td>Poor (P)</td>
</tr>
</tbody>
</table>

Minimum recommended threshold is fair for gross or ≥30% progressive motility.

Minimum recommended threshold for morphology is 70% normal sperm.

*Guidelines for Uniform Beef Improvement Programs — The Beef Improvement Federation (Recommendations from The Society For Theriogenology)*