Reproductive Male Anatomy – LAB

*Students will examine and compare male reproductive anatomy and physiology of both bovine and equine species. As a result of this laboratory exercise, the student will:*

1. Describe reproductive cycles and relate them to breeding systems (130.7, 6-A)
2. Recognize the significance of meiosis to sexual reproduction (130.7, 6-C)
3. Identify external anatomy of both the bull and the stallion (130.7, 8-A,B,C,D)
4. Compare the anatomy and physiology of the reproductive systems of bovine and equine species (130.7, 8-B)
5. Discuss the impacts of biotechnology on the production of livestock such as cloning, artificial insemination, and freezing of semen and embryos (130.7, 12-A)
6. Communicate valid conclusions supported by data collected during laboratory exercises (130.7, 2-H)
7. Use critical thinking, scientific reasoning and problem solving to analyze, evaluate, and critique scientific explanations as it is applicable to experimental and observational testing (130.7, 3-A)
8. Design, conduct and complete research to solve a self-identified problem in scientific animal agriculture (130.7, 12-D) (examples may include sexing sperm, identification of heritable defects, etc.)

**INTRODUCTION:** The reproductive system’s sole purpose is to produce offspring. It affects other parts of the body, including growth & development, as well as behavior, but all other influences are focused on promoting breeding and pregnancy.

This lab exercise focuses on the male reproductive system, which 1) produces male sex hormones (testosterone), 2) produces and stores the male reproductive cells (spermatozoa), and 3) delivers them to the female reproductive tract at the time of breeding.

**MATERIALS NEEDED:**  *Each lab group will set up with the following items*: Handout - Testicle Anatomy

Microscope ziplock bag containing either bovine or equine testicle dissection kit lab gloves

safety glasses 4 glass microscope slides coverslips observation & summary sheet (1/student)

**TO BE IDENTIFIED:**

Scrotum Testes Vaginal Tunics and Testis Capsule Epididymis Vas Deferens Spermatic Cord

**PROCEDURE:** Set up microscope and prepare work space. Gather necessary lab materials. Remove testicle from storage bag. All lab group members will be able to easily identify all required structures and label them on his/her own observation & summary (OS) sheet. Once all external structures are identified & labeled, group members will begin dissection, as demonstrated by instructor (see **Cross Section of the Testis**). Label specified internal structures on OS sheet.

Moving on to **Schematic of the Testis**, identify and label specific structures. Once all parts have been identified and properly labeled, lab groups will proceed to carefully **prepare & label the following microscope slides**, as demonstrated by instructor:

1. Seminiferous tubules (convoluted and straight) 2) sperm cells from the head of the epididymis

3) sperm cells from the vas deferens 4) sperm cell sample from the body of the epididymis

Using the slides prepared by lab groups, answer the questions on the OS sheet. It would be a good idea to first read over your OS sheet, as it will help guide you through your investigation. As you examine and compare slides, consider each structure and its function.

As a researcher, what questions should you ask yourself as a result of this lab exercise?

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Answers:

1. Are there any visible anatomical differences between bovine and equine testis?
2. Are there noticeable differences in sperm cells extracted from the three different parts of the epididymis?
3. What are the differences, if any?
4. If differences are noticed, what would be a reasonable explanation for these differences?