

Course	Agricultural Science I
Unit	Introduction to Animal Reproduction
Lesson	Male Reproductive System
Estimated Time	50 minutes

Student Outcome

Explain the purpose of male reproductive parts and hormones.

Learning Objectives

1. Identify the male reproductive parts.
2. Describe the functions/purposes of the male reproductive parts.
3. Identify the male reproductive hormones.
4. Describe the role each male hormone plays in reproduction.

Grade Level Expectations

SC/LO/3/A/09-11/a

Resources, Supplies & Equipment, and Supplemental Information

Resources

1. PowerPoint Slides
 - ☐ PPt 1 – Reproductive System of the Bull
 - ☐ PPt 2 – Reproductive System of the Boar
 - ☐ PPt 3 – Reproductive System of Fowl – Rooster
 - ☐ PPt 4 – Reproductive System of the Ram
 - ☐ PPt 5 – Reproductive System of the Stallion
 - ☐ PPt 6 – Reproductive System of the Dog
 - ☐ PPt 7 – Reproductive System of the Rabbit
 - ☐ PPt 8 – Male Reproductive Hormones
2. Activity Sheets
 - ☐ AS 1 – Reproductive System of the Bull
 - ☐ AS 2 – Dissection of a Testicle
3. *Introduction to Animal Reproduction (Student Reference)*. University of Missouri-Columbia: Instructional Materials Laboratory, 1996.
4. *Introduction to Animal Reproduction Curriculum Enhancement*. University of Missouri-Columbia: Instructional Materials Laboratory, 2003.

Supplies & Equipment

- ☐ Obtain beef testicles for dissection; keep the testicles frozen until the dissection is performed.

Supplemental Information

1. Internet Sites
 - ☐ Animal Science Publications. MU Extension. University of Missouri-Columbia. Accessed April 12, 2007, from <http://extension.missouri.edu/explore/agguides/ansci/>.








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- ❑ Fanning, M, J. Selph, and S. Eubanks. "Managing Reproduction." *Florida Cow-Calf Management*. University of Florida. Accessed June 12, 2007, from <http://edis.ifas.ufl.edu/AN119>.
 - ❑ Hamilton, T. *Beef Bull Fertility*. Government of Ontario. Accessed June 14, 2007, from <http://www.omafra.gov.on.ca/english/livestock/beef/facts/06-015.htm>.
 - ❑ Loch, W. and J. W. Massey. *Horse Breeding Arithmetic: 2 + 2 = 1*. University of Missouri-Columbia Extension Division agricultural publication, G2790. Accessed June 12, 2007, from <http://extension.missouri.edu/explore/agguides/ansci/g02790.htm>.
 - ❑ Managing Pig Health – Reproductive System. ThePigSite.com. Accessed June 12, 2007, from <http://www.thepigsite.com/pighealth/article/8/reproductive-system>.
 - ❑ Structure and Function of the Reproductive System of the Bull, Boar, and Stallion. University of Wisconsin. Accessed June 14, 2007, from http://www.wisc.edu/ansci_repro/lec/handouts/hd2.html.
 - ❑ Understanding Poultry Illness and Anatomy. Black Forest Poultry. Accessed June 14, 2007, from <http://www.blackforestpoultry.com/howto.html>.
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Interest Approach


Display a beef testicle. Ask the students what it is. Then ask the students the following questions: What is the purpose of the testicle? How does a testicle assist in producing offspring?

Communicate the Learning Objectives

1. Identify the male reproductive parts.
2. Describe the functions/purposes of the male reproductive parts.
3. Identify the male reproductive hormones.
4. Describe the role each male hormone plays in reproduction.

Instructor Directions	Content Outline
Objective 1 <i>Hand out AS 1. Label all the reproductive parts of the bull using PPt1. Display the PPts for the swine, sheep, horse, dog, rabbit, and fowl. Discuss the differences among the species. Have students complete AS 2.</i>  AS 1 – Reproductive System of the Bull  AS 2 – Dissection of a Testicle  PPt 1 – Reproductive System of the Bull  PPt 2 – Reproductive System of the Boar  PPt 3 – Reproductive System of Fowl – Rooster  PPt 4 – Reproductive System of the Ram  PPt 5 – Reproductive System of the Stallion	Identify the male reproductive parts. Bull reproductive parts <ol style="list-style-type: none">1. Testicles2. Scrotum3. Epididymis4. Vas deferens5. Seminal vesicles6. Prostate gland7. Cowper's (bulbourethral) gland8. Urinary bladder9. Urethra10. Sigmoid flexure11. Retractor muscle12. Penis13. Sheath Boar reproductive parts <ol style="list-style-type: none">1. Parts similar to the bull's, but testicles located at the rear of the boar2. Penis shaped like a corkscrew Ram reproductive parts <ol style="list-style-type: none">1. Filiform appendage extends from head of penis2. Sheath also referred to as prepuce Stallion reproductive parts <ol style="list-style-type: none">1. Less pendulous scrotum located further to rear of animal2. No sigmoid flexure

Instructor Directions	Content Outline
<div data-bbox="180 258 542 331"> <input type="checkbox"/> PPt 6 – Reproductive System of the Dog </div> <div data-bbox="180 415 542 489"> <input type="checkbox"/> PPt 7 – Reproductive System of the Rabbit </div>	<div data-bbox="662 218 1256 373"> <p>Dog reproductive parts</p> <ol style="list-style-type: none"> 1. No Cowper's gland or seminal vesicles 2. No sigmoid flexure 3. Sheath of penis referred to as prepuce </div> <div data-bbox="662 415 1281 646"> <p>Buck reproductive parts</p> <ol style="list-style-type: none"> 1. Scrotum referred to as inguinal pouch 2. Sheath referred to as prepuce 3. Prostate gland separated into three parts 4. No Cowper's gland 5. No sigmoid flexure </div> <div data-bbox="662 688 1463 961"> <p>Fowl reproductive parts</p> <ol style="list-style-type: none"> 1. No scrotum 2. Testicles located within abdomen, next to backbone 3. Vas deferens connects testicles to cloaca, papillae, and vent 4. Papillae within cloaca 5. No urethra or urinary bladder </div>
<div data-bbox="155 984 310 1016"> Objective 2 </div> <div data-bbox="180 1100 613 1365"> <p><i>Discuss the function and purpose of each of the reproductive parts of the bull. Explain the functions of any reproductive parts found in other species not found in the bull. Use PPt1 as an illustration while explaining the functions.</i></p> </div> <div data-bbox="180 1407 542 1480"> <input type="checkbox"/> PPt 1 – Reproductive System of the Bull </div>	<div data-bbox="638 984 1403 1052"> <p>Describe the functions/purposes of the male reproductive parts.</p> </div> <div data-bbox="662 1094 1451 1915"> <p>Functions of bull reproductive parts</p> <ol style="list-style-type: none"> 1. Testicles - produce sperm and hormones associated with reproduction 2. Scrotum - carries testicles and regulates their temperature 3. Epididymis - stores, concentrates, and transports sperm 4. Vas deferens - transports sperm from the epididymis to the urethra 5. Urethra - carries sperm and urine to the penis 6. Urinary bladder - stores urine; has no reproductive function 7. Seminal vesicles - produce seminal fluid that transports and protects the sperm 8. Prostate gland - nourishes the sperm with a thick, milky fluid 9. Cowper's (bulbourethral) gland - releases fluid into urethra to cleanse and neutralize it to allow sperm to survive in it 10. Sigmoid flexure - extends the penis outside the body during mating </div>

Instructor Directions	Content Outline
	<ol style="list-style-type: none"> 11. Retractor muscle - pulls the penis back into the body 12. Penis - deposits semen in the female reproductive tract and excretes urine from the body 13. Sheath - covers and protects the penis when it is relaxed <p>Functions of the boar reproductive parts - the same as the bull's</p> <p>Functions of the ram reproductive parts - the same as the bull's; filiform appendage is an extension of the urethra</p> <p>Functions of the stallion reproductive parts - the same as the bull's</p> <p>Functions of the dog reproductive parts - the same as the bull's</p> <p>Functions of the buck reproductive parts - the same as the bull's</p> <p>Functions of the fowl reproductive parts</p> <ol style="list-style-type: none"> 1. Testicles - produce sperm and hormones and secrete seminal fluid 2. Vas deferens - transports sperm and seminal fluid from the testicles to the cloaca 3. Cloaca - the site where the reproductive and digestive systems are joined; joins the female cloaca when mating 4. Papillae - transport sperm the female reproductive tract during mating 5. Vent - empties reproductive and digestive products from the body
<p>Objective 3</p> <p><i>Ask students to explain what a hormone is. Emphasize where the various hormones originate. Use PPT8 to discuss hormones in all species except fowl.</i></p> <p> PPT 8 – Male Reproductive Hormones</p>	<p>Identify the male reproductive hormones.</p> <ol style="list-style-type: none"> 1. Gonadotrophin releasing hormone (GnRH); not present in fowl 2. Follicle stimulating hormone (FSH) 3. Luteinizing hormone (LH), also known as interstitial cell stimulating hormone (ICSH) 4. Androgens - testosterone; another androgen produced in rabbits

Instructor Directions	Content Outline
<p>Objective 4</p> <p><i>Discuss the importance of male hormones in reproduction. Point out that each hormone has a role and that together they are in a delicate balance. Emphasize that hormones are the reason successful reproduction occurs. Continue to use PPT8 while discussing each hormone.</i></p> <p>☐ PPT 8 – Male Reproductive Hormones</p>	<p>Describe the role each male reproductive hormone plays in reproduction.</p> <ol style="list-style-type: none"> 1. GnRH - stimulates the anterior pituitary gland in the brain to release FSH and LH, except in fowl, in which FSH production in fowl triggered by increased light 2. FSH - stimulates the seminiferous tubules to produce sperm 3. LH - stimulates the interstitial cells to secrete androgens 4. Androgens (testosterone) - stimulate the development, growth, and activity of reproductive parts; trigger puberty and the development of secondary sex characteristics; stimulate sex drive; function in the production of sperm
<p>Application:</p> <p>📄 AS 1 – Reproductive System of the Bull</p> <p>📄 AS 2 – Dissection of a Testicle</p>	<p>Answers to AS 1</p> <ol style="list-style-type: none"> 1. Prostate gland 2. Seminal vesicles 3. Cowper’s (bulbourethral) gland 4. Urinary bladder 5. Retractor muscle 6. Vas deferens 7. Urethra 8. Penis 9. Sigmoid flexure 10. Sheath 11. Testicle 12. Epididymis 13. Scrotum <p>Answers to “Key Questions” on AS 2</p> <ol style="list-style-type: none"> 1. Head of the epididymis 2. Seminiferous tubules 3. Sperm is produced in the seminiferous tubules of the testicle. The sperm move from the seminiferous tubules through the head, body, and tail of the epididymis and enter the vas deferens from the testicle. <p>Other activities</p> <p>Contact a local veterinarian to obtain a male reproductive tract from any animal species. Do a dissection, identifying and explaining all the male reproductive parts.</p>

Instructor Directions	Content Outline
Closure/Summary	Reproduction is vital for the survival of each species. Male reproductive parts and hormones have specific and important roles in reproduction.
Evaluation: Quiz	<p>Answers:</p> <ol style="list-style-type: none"> 1. Seminal vesicles 2. Vas deferens 3. Prostate gland 4. Cowper's (bulbourethral) gland 5. Urinary bladder 6. Retractor muscle 7. Urethra 8. Testicle 9. Sigmoid flexure 10. Epididymis 11. Penis 12. Scrotum 13. Sheath 14. i 15. h 16. k 17. g 18. j 19. f 20. d 21. a 22. d 23. b 24. c