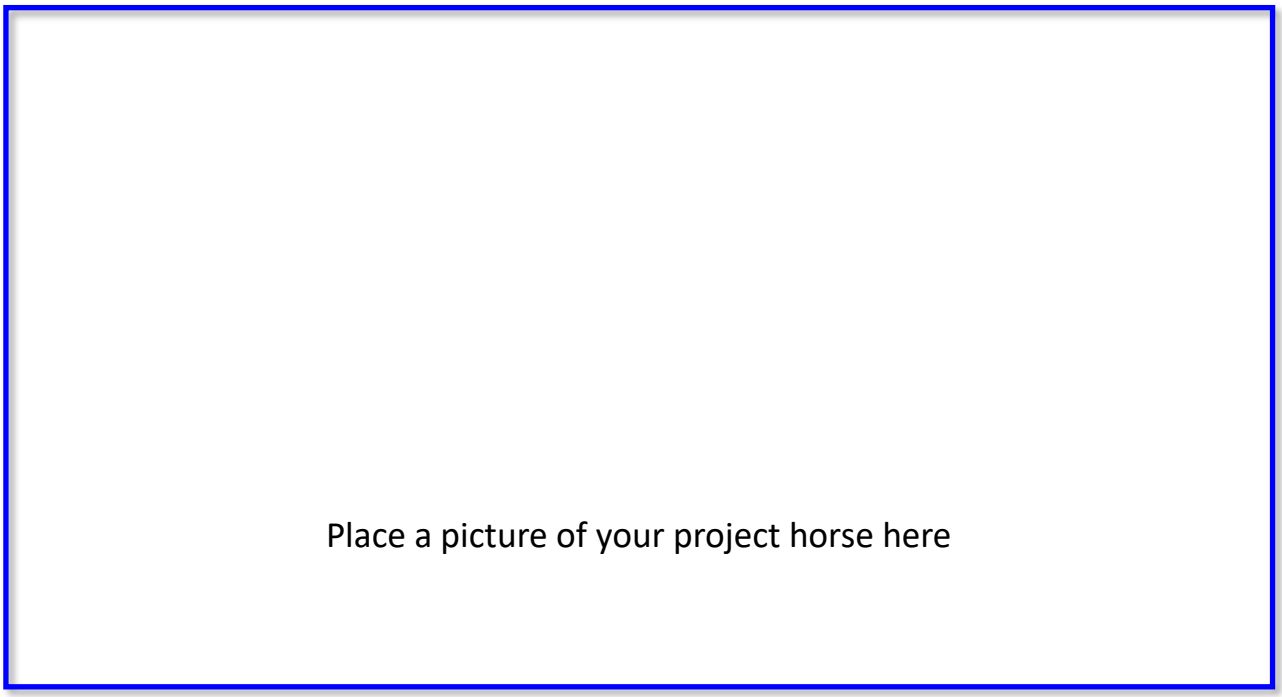
Senior
4-H Horse Project Book
(3rd Year Senior)



Name: _____Birthdate: _____

Address:_____

Town: _____ State: _____ Zip Code: _____

Name of 4-H Club_____

Club Leader: _____

Years in 4-H: _____ Years in Horse Project: _____

Targeting Life Skills

New York State 4-H Horse Program

The 4-H Motto

To Make the Best BETTER

4-H PLEDGE

I pledge my **HEAD** to clearer thinking,
my **HEART** to greater loyalty,
my **HANDS** to larger service,
and my **HEALTH** to better living,
for my club, my community,
my country, and my world.

My 4-H Project Story

Activities you did with your club. Different programs/clinics you attended. What you and your horse learned this year. Fun things you did. What part of your project you liked best. What you gained out of being in the 4-H program

Activities:

Below is a list of activities you may choose from to complete your horse project. Please choose 4 and describe below or on the next 2 pages. (Staple additional pages if needed)

-Discuss horse overnight camping skills and develop a plan to go on an overnight camping trip with your horse.

-Discuss the different equestrian sports that compete at an international level.

-Write at least a paragraph on how do you promote the horse project to other 4-H members and community members.

-Identify and discuss a problem affecting the horse industry and write at least 2 paragraphs.

-Design your ideal horse trailer and describe why it fits your needs

-Conduct a horse economic impact survey.

-Identify the steps for preparing a mare for breeding.

Activities

Activities Continued

IMMUNIZATION

Date	Vaccination

PARASITIC CONTROL

Date	Product

HOOF CARE

Date	Details

DENTAL CARE

Date	Details

PHYSICAL & MEDICAL RECORD

Date	Details

NOTES

Date	Details

How are horses marked for positive identification?

Proper identification of horses is necessary and important. Thorough and effective identification ensures that the horse being bought, sold, raced or bred is indeed the horse claimed. Some of the circumstances for a positive identification include animal health and disease control, theft prevention, slaughter, thefts, personal use, natural disasters; and fraud prevention for shows and competitions, sales and auctions, breeding, racing and insurance. Reliable horse identification becomes especially critical in emergency situations. Lessons learned from natural disasters demonstrate that lack of permanent identification leads to theft and confusion over ownership as horses stray, are evacuated, or are otherwise separated from their owners. Horse identification is also important during outbreaks of serious infectious disease. Disease control officials need to know which horses traveled where, and they need to identify horses that may have been exposed to the disease. In the early 1900s, the thoroughbred racing industry was having problems with "ringers" running under assumed names. A ringer is a falsely identified horse entered in a race below its class, giving it an almost certain chance to win. The Jockey Club was the first organization in the United States to set up an accurate identification system for horses.

Today several methods are used to identify horse, including natural body markings, tattooing, hot iron branding, freeze branding, blood typing, DNA, microchips and Radio Frequency Identification (RFID).

NATURAL BODY MARKINGS AND COLORS

Owners should keep clear photographs of individual horses on file with other paperwork such as registration papers and health records. Precise photographs can help law enforcement authorities and brand inspectors identify stolen horses. Photographs provide details of the color and other body markings used to identify a horse.

Natural body markings for identification include chestnuts, cowlicks (hair whorls or trichoglyphs), dimples, patterns on the head or feet, and coat color. Body markings are kept in a record as a picture or drawings.

Chestnuts or night eyes are horny, irregular growths on the inside of the horse's legs. On the front legs, they are just above the knee. On the rear legs, they are toward the back of the hock.

Hair whorls, also called cowlicks or trichoglyphs, are permanent hair whorls which cannot be brushed or clipped out. They are located mainly on the forehead and neck.

Dimples are permanent indentations in the muscle under the skin. They are usually located at the point of the shoulder or in the neck muscles.

Other markings can include white or black patches on the body as well as scars. Firing marks (scars) on the legs are also useful markings for identifying horses.

Head markings:

Unique markings or patterns on the head provide another method for identifying horses. These include the star, stripe, snip, blaze and the bald face.

Leg markings:

White leg markings used in identification include the following: one covering the coronet band, from the coronet to the pastern, from the coronet to the fetlock, a half stocking, a stocking, a stocking plus, a separate white mark on the knee or hock, white spots on the front of the coronet band or on the heel, or dark spots on a white coronet band.

Colors:

Signalment, a detailed description of appearance, describes the presence and location of color on a horse. This is best recorded in clear photographs and with careful drawings incorporated into registration papers. Some associations require owners to attach photographs to registration certificates. Coat colors include bay, black, blue roan, brown, buckskin, chestnut, dun, gray, grullo, paint, palomino, red dun, red roan or white.

TATTOOS Tattoos often consist of a letter which corresponds to the year the horse was born and a number which matches the registration number of the horse. The letters assigned to years of birth differ between several breed associations. The tattoo may be placed in several areas, but the upper lip is the most common site. The actual tattoo instrument is comprised of a chrome-plated brass block which contains a needle pattern with a varying number of needles, depending on the particular number or letter. Before the tattoo is applied, the identity of the horse is assured. The horse is carefully examined for color, marking, cowlicks, chestnuts and other easily identifiable traits. Once the identity of the horse is assured, the mucous membrane on the upper lip of the horse is exposed using a lip clamp. The area is cleaned with alcohol, and the proper digits are placed in the tattoo gun. The gun is then dipped in an antiseptic and applied to the lip. Then ink is rubbed into the perforations.

HOT IRON BRANDING Hot iron branding, also called fire branding, uses a heated iron. Traditional irons were heated by fire, but electronic irons are also available. This is the oldest method of permanent marking, but hot branding of horses has lost popularity in recent years in favor of other methods. Hot brands identify the horse with a mark belonging to a specific farm or ranch.

FREEZE BRANDING Freeze branding uses copper stamps or marking rods that are cooled in liquid nitrogen (-321 F). Freeze brands are applied to the neck under the mane or to the shoulder. The area to be branded is shaved and washed with alcohol, which aids in conducting the intense cold. The cold copper stamp is applied to the animal's skin for 10 to 20 seconds. Immediately after the brand is applied, an indention is left in the skin. Some swelling may occur in the first few days. After about two months, a distinct and permanent mark remains. The intense cold kills the pigment-producing cells, called melanocytes, leaving an area of pigment-free skin. On dark-colored animals, the hair grows back white; and on white animals, an area with no hair results. As with other methods of marking horses, the identity of the horse is double-checked before the brand is applied. Freeze branding has many advantages over fire branding. A freeze brand produces minimal changes in the hide, is more distinct and legible, does not produce an open wound, and is relatively painless. Most breed associations require that papers of horses be returned after a horse is branded so that the mark can be recorded on the registration certificate. To be valid, a brand needs to be registered in the county or in the state where the horse owner lives. Horse owners who develop a personalized brand should check to be sure the brand or mark is not already being used by another horse owner, ranch, farm or facility.

BLOOD TYPING Although markings, tattooing and freeze branding are effective in differentiating individual horses, blood typing has also been developed over recent years and is used to verify a horse's parentage. Serologists test for the 16 most common blood antigens and serum proteins. Blood typing is used by the Jockey Club, the American Quarter Horse Association, the Arabian Horse Registry and others.

DNA FINGERPRINT Various associations are starting to use DNA testing to verify the parentage of race horses before a lip tattoo can be applied. The association sends a kit to the horse owner, who places a sample of the horse's hair into the kit and sends it to a national testing lab. The DNA testing process can take about three weeks and is expensive.

MICROCHIP IDENTIFICATION To discourage thieves from stealing horses and to aid in recovery of stolen horses, a new method of identifying horses has emerged over the past few years. The implantation of a small microchip the size of a grain of rice containing the horse's registration number or identification number can assist in identifying a horse in case it is stolen. The microchip is a transponder encapsulated in biocompatible glass. A specially designed needle and syringe implants the microchip. The chip is actually lodged about an inch underneath the skin's surface in the upper neck. It is equipped with a nonmigratory tip to ensure that it stays in place. These are passive devices and can be used indefinitely. Several companies provide the chips and the readers. The microchip identification cannot be altered. The chip is read by using a hand-held scanner, similar to those used in grocery stores. Many slaughterhouses and brand inspectors have scanners for identification. Some horse owners prefer electronic identification because it does not change the horse's external appearance.

RADIO FREQUENCY IDENTIFICATION Radio Frequency Identification or RFID is essentially the same as microchip identification, but it is the new term that is receiving lots of attention in the media. RFID is a proven technology that has been around since at least the 1970s. Until recently the technology has been too expensive and too limited to be practical for many commercial applications. Now the cost is within reason and the uniqueness of RFID tags means that a product may be individually tracked as it moves from location to location, finally ending up in the consumer's hands.

Retailers such as Walmart are pushing for the use of RFID. RFID is also being considered and tested as a means of creating a national animal identification system for tracking all livestock species including cattle, swine, sheep, goats, horses, poultry, bison, deer, elk, llamas and alpacas.

RFID is a generic term for technologies that use radio waves to automatically identify people, livestock or objects. There are several methods of identification, but the most common is to store a serial number that identifies a person, animal or object, and perhaps other information, on a microchip that is attached to an antenna. The chip and the antenna together are called an RFID transponder or an RFID tag). The antenna enables the chip to transmit the identification information to a reader. The reader converts the radio waves reflected back from the RFID tag into digital information that can then be passed on to computers for storage or analysis.

The smallest and least expensive RFID devices are passive, meaning that they only store a limited amount of information and do not have a power supply. A minute electrical current is induced in the antenna by the incoming radio-frequency scan. This provides enough power for the tag to send a response.

Active RFID tags have a power source and may have longer ranges and larger memories than passive tags. Active tags also have the ability to store additional information sent by the transceiver. Currently, the smallest active tags are about the size of a coin. Many active tags have practical ranges of hundreds of feet and a battery life of up to several years.

Complete this worksheet to review key concepts from the lesson.

1. Reliable horse identification is especially important in _____ situations or during _____ outbreaks.

2. Body markings can be recorded using a _____ or _____ .

3. _____ is a detailed description of appearance. It includes the presence and location of _____ on a horse.

4. Tattoos often include a _____ corresponding to the year the horse was born and a _____ matching the registration number of the horse.

5. The _____ _____ (body location) is the most common site for placing a tattoo.

6. Hot iron _____ uses a heated iron as a way to permanently mark horses.

7. _____ branding uses copper stamps or marking rods cooled in liquid _____ .

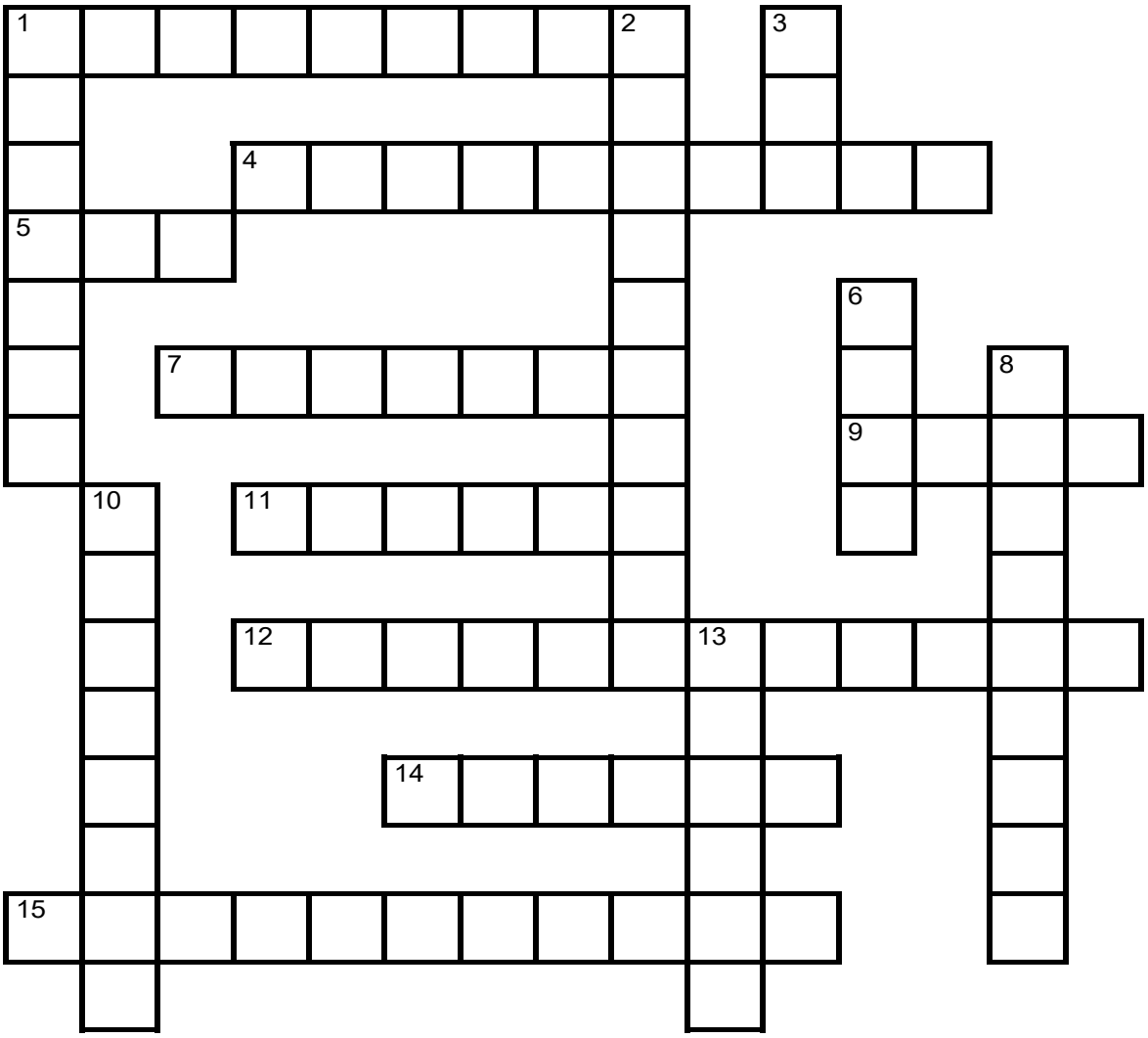
8. Blood _____ can be used to verify a horse's _____ .

9. A small _____ about the size of a grain of rice can be implanted under the horse's_____ in the upper neck.

10. _____ _____ _____ (RFID) is a generic term for technologies using _____ waves to automatically identify people, livestock or objects.

11. _____ RFID devices do not have a power supply. _____ RFID tags have a power source.

Marking and Identifying Horses



Across

1. Another name for night eyes
4. Picture taken by a camera
5. Most common place for horse tattoo
7. Substance to clean skin before tattooing
9. Short for Radio Frequency Identification
11. Indentation found on shoulder or neck
12. Where branding must be recorded
14. ____ marks are scars.
15. Pigment-producing cells

Down

1. Another name for hair whorl
2. Detailed description of appearance
3. ____ testing can determine parentage.
6. ____ branding uses heat.
8. Tiny product used for identification
10. Cold substance used in freeze branding
13. Horse racing under an assumed name

Understanding Mare Reproductive Physiology

What organs make up the mare reproductive tract, and what behavioral and physiological cycles do I need to know about to successfully breed mares? Understanding the physiological process of the mare's reproductive cycle is the first step to successfully breeding your mare. This lesson will discuss the organs that make up the reproductive tract as well as the hormonal cycle involved. The mare reproductive tract consists of two ovaries, two fallopian tubes, uterus, cervix, vagina and vulva. The mammary gland is an accessory sex gland of the mare.

VULVA The vulva is the exterior opening to the reproductive canal. It consists of the labia, clitoris and the vestibule. The area between the anus and the upper part of the vulva collects feces and may create a conformation which encourages breaching of the labial seal. When this occurs, air and debris can be sucked into the internal reproductive tract. This condition is known as pneumovagina, or windsucking. The pelvic conformation predisposing a mare to this defect may be inherited and, therefore, cannot be altered. However, the vulva can be artificially sealed by suturing the labia together, a procedure which is known as an episoplasty or Caslick operation.

VAGINA The vagina consists of 6- to 8-inch-long muscular, mucous membrane-lined tube which connects the vestibule of the vulva to the cervix. The vagina changes in vascularity and color due to hormonal changes that occur during the mare's estrous cycle.

CERVIX Basically a highly distensible muscle, the cervix acts as a physical barrier between the vagina and the uterus. Its shape and characteristics change significantly in response to the mare's estrous cycle. In response to increased estrogen produced during estrus, the cervix appears pink due to increased vascularity. During this period, it produces abundant thin, watery mucus and is so relaxed that it is often found lying limply on the vaginal floor. This flaccid cervical tone facilitates passage of semen or breeding instruments directly into the uterus during live cover or artificial breeding. In contrast, when the cervix is under the influence of progesterone during the diestrous period and pregnancy, it appears blanched, produces a thick, sticky mucus, is tightly closed and held in the center of the vaginal wall.

UTERUS This is a multilayered, hollow, Y-shaped organ with a uterine body, and two branches called horns. The uterus is suspended within the body cavity by two tough, sheet-like structures called the broad ligament. The middle layer consists of two sheets of muscular tissue, one oriented longitudinally and one circularly. This is called the myometrium and is responsible for the powerful contractions which expel the foal at birth. The endometrium is the innermost layer, and is a complex mucosal membrane containing a rich blood supply and many glands.

OVIDUCTS Also known as fallopian tubes, the oviducts are tiny, highly coiled tubes. Each connects the tip of a uterine horn with an ovary. The end of the oviduct surrounds the ovary. The ovarian end of the oviduct is called the infundibulum. It is enlarged and shaped like a catcher's mitt with finger-like projections called fimbriae. Fertilization of the ovum occurs in the oviduct. The final portion of the oviduct, where it narrows to join the uterus, is called the isthmus.

OVARY The ovaries of the mare are unique both in shape and makeup. They are kidney bean-shaped, and vary in size and texture between the breeding and nonbreeding seasons. The concave side of the ovary contains an area unique to the mare, the ovulation fossa. This wedge-shaped area is the only portion of the ovary from which an ova may be shed (ovulated). One of the cortical structures is called the follicle. Follicles 35 millimeters or greater are considered capable of ovulating. As the enlarged preovulatory or Graafian follicle nears maturity, it bulges from the ovary's surface. This bulge can be felt through the rectal wall when the mare's ovaries are manually palpated. Another cortical structure, the corpus luteum, forms from the tissues remaining after a follicle ruptures at ovulation. Unlike the follicle, the corpus luteum is solid-cored and secretes the hormone progesterone.

SEASONAL POLYESTROUS

During the nonreproductive (winter) season, most mares are in a state of reproductive quiescence (or hibernation) called anestrus. During this time, they will not respond to the stallion's attention, their ovaries do not develop any structures, and there is minimal ovarian hormone secretion. The situation is very different during the spring and summer. During this season of reproductive activity, the mare will experience a series of estrous cycles. These cycles will repeat at 21- to 23-day intervals until pregnancy occurs or until she reverts back into anestrus with the advent of winter. Because the mare undergoes estrous cycles only during a certain times of the year, the mare's reproductive habits are seasonally polyestrous.

REPRODUCTIVE BEHAVIOR There are two different stages of the estrous cycle. Estrus (heat) lasts an average of five to seven days. Estrus is characterized by receptivity to the stallion. A mare showing classical estrous behavior will adopt a urination stance -- squatting with legs spread and tail raised. She will lean into the stallion, urinate small volumes frequently, and expose her clitoris by everting her vulva (winking). Diestrus lasts an average of 14 - 16 days. During diestrus, the mare rejects the stallion with behavior typically seen in the form of tail switching, squealing, striking, biting and/or kicking.

ENDOCRINOLOGY OF REPRODUCTION The processes involved with reproduction in the mare are driven by the action of substances known as hormones. The study of hormones and their effects is called endocrinology. The control of reproduction is precise and richly complex.

The pelvic reproductive organs (ovaries, oviducts and uterus), are players that interact and are controlled by the hypothalamus. It is located far from the abdominal cavity, deep within the tissues of the midbrain. The hypothalamus is responsible for receiving and interpreting messages from many sources, both intrinsic and extrinsic, and coordinating their signals to produce the desired effects. The hypothalamus is capable of exerting moment-to-moment control over the events occurring during each estrous cycle, as well as long-term control over seasonal reproduction.

** Environmental cues signal the start of the reproductive season by producing a chemical signal in the form of gonadotropic releasing hormone (GnRH), which is released from the hypothalamus. GnRH stimulates a small gland located at the base of the brain called the pituitary.

** In response to the stimulus from GnRH, the anterior portion of the pituitary releases two gonadotropic hormones, Follicle Stimulating Hormone (FSH) and Luteinizing Hormone (LH). These two hormones are responsible for stimulating the ovaries. FSH stimulates the growth of follicles.

** When follicles reach a certain stage of development (approximately 20 to 25 mm in diameter), they begin to secrete the steroid hormone Estradiol which is a specific form of estrogen. Estradiol levels continue to rise throughout estrus, peaking immediately prior to ovulation.

** It is this high concentration of estradiol circulating throughout the body which reaches the brain and stimulates the release of LH. LH is responsible for stimulating ovulation and supporting the initial stages of corpus luteum development.

** Ovulation generally occurs toward the end of estrus. Follicles undergo a rapid conversion to form a corpus luteum (CL). The luteal cells within CL secrete another steroid hormone called progesterone.

** Circulating progesterone reaching the brain acts to inhibit the release of LH from the pituitary. Progesterone changes the mare's behavioral pattern into that typical of diestrus.

** If the mare does not conceive, progesterone production is halted. This is accomplished through the action of prostaglandin F2 (PGF2). If the mare is not pregnant, PGF2 is released from the uterus 14 to 16 days following ovulation. It travels to the ovary where it causes destruction of the CL by a process known as luteolysis.

1. Using the behavioral data provided below, indicate when the horse would be receptive to breeding, and tell which day she most likely ovulated.

Miss Bo Socks:
March 5-7 not receptive to the stallion
March 8-9 starting to show heat, raised tail
March 10 Receptive to the stallion, showing classic signs of heat
March 11 - 12 good standing heat
March 13 out of heat

Stallion Reproductive Physiology

What organs make up the stallion's reproductive system, and what physiological processes do I need to know about to successfully use stallions for breeding?

Understanding the physiological process of the stallion's reproductive cycle is crucial to a successful breeding program. This lesson discusses the organs making up the male equine reproductive system as well as the hormonal cycle involved. The stallion's reproductive system includes two testes with attached epididymides, two deferent ducts, urethra, penis and accessory sex glands (bulbourethral, prostate and vesicular).

The testes can be considered the master organ of the male's reproductive system because the testes are the site for the production of spermatozoa (spermatogenesis) and the primary male sex hormone, testosterone. Generally, as testicular size increases, the potential ability to produce spermatozoa increases.

In addition to individual differences in testicular size, seasonal and age variations exist. During periods of short daylight length, when testosterone concentrations are depressed, testicular size is smaller as compared to testicular size during the normal breeding season when day length periods are long and testosterone concentrations are highest. Testicular size in the stallion increases until about 12-13 years of age.

The retention of one (unilateral) or both (bilateral) testicles in the body cavity occurs fairly frequently in stallions and is referred to as cryptorchidism.

HORMONAL CONTROL

Hormonal control of reproductive function involves the testes, a center in the brain known as the hypothalamus, and a small gland located at the base of the brain known as the pituitary gland. A simplified scheme involves the release of gonadotropin releasing hormone (GnRH) from the hypothalamus, which travels through portal blood vessels to the anterior pituitary.

At the anterior pituitary, GnRH stimulates the secretion of the gonadotropins, follicle stimulating hormone (FSH) and luteinizing hormone (LH). These gonadotropins travel to the testes, where FSH exerts its effect on the Sertoli cells and LH on the Leydig cells. Sertoli cells are located within the testes' seminiferous epithelium and function primarily in supporting spermatozoa development. Sertoli cells also secrete a number of proteins which function in the regulation of FSH release from the anterior pituitary gland, and proteins which bind testosterone.

Leydig cells are located between the seminiferous tubules, and under the influence of LH, are responsible for testosterone production. In addition, Leydig cells secrete estrogens. The proteins produced by Sertoli cells which bind testosterone are responsible for maintaining the necessary testicular concentrations.

Testosterone concentrations control the release of GnRH and the gonadotropins (and thus its own concentration) through a negative feedback system. When concentrations of testosterone are high, the system slows down testosterone production due to the inhibition of the hypothalamus and anterior pituitary gland. Likewise, when testosterone concentrations are low there is no inhibition and the system increases testosterone production.

Testosterone concentrations are actually reduced when animals are receiving anabolic steroids. Therefore, the stallion displays normal sexual behavior, but testicular size and sperm production are severely impaired. Sperm production will remain reduced for as long as the anabolic steroid is being administered and will not return to a normal level of production for approximately two months after cessation of treatment.

When daylight periods are short, a gland located within the brain known as the pineal gland releases melatonin. Melatonin is thought to inhibit the hypothalamus from releasing GnRH, which subsequently decreases LH and testosterone production. Thus, during periods of short daylight (winter), male reproductive function is suppressed due to low testosterone concentrations. During this time, testicular size and sperm production are reduced, and although sexual behavior is variable, it is not uncommon for stallions to have low sexual drive (libido), and to require a longer time to mount and ejaculate. Stallions can be placed under artificial lights to increase testicular activity. Normally, stallions are exposed to a total day length of 16 hours beginning in December. Testicular size and sperm production will approach normal breeding season values in approximately 60 days.

SPERM PRODUCTION Spermatogenesis occurs within the seminiferous epithelium and serves two primary purposes: first, spermatogenesis maintains a population of uncommitted germ cells from which future spermatozoa can be produced. Secondly, spermatogenesis results in the formation of committed germ cells (spermatogonia) which eventually give rise to spermatozoa. This process involves a series of events which can be divided into three phases; spermatocytogenesis, meiosis, and spermiogenesis. Each of these three phases require 18-19 days, and the entire series of events leading to release of spermatozoa requires 57 days.

Once spermatozoa are released within the seminiferous tubules, they travel through a series of ducts to the epididymis, which is lightly attached to the dorsal surface of the testis. The epididymis can be divided into three segments: the head (caput), body (corpus) and tail (cauda). Within the epididymis, spermatozoa undergo modifications (maturation) in which they acquire the ability to swim and to fertilize an egg. The migration of spermatozoa through the epididymis requires approximately eight days. Most of the spermatozoa are stored in the tail of the epididymis until ejaculation. The length of time required for spermatogenesis and epididymal maturation is species specific and is about 65 days in the stallion.

DAILY SPERM OUTPUT The minimum number of spermatozoa produced within a 24 hour period is known as daily sperm production (DSP). DSP varies among stallions and is influenced by testicular size. Daily sperm output (DSO) refers to the number of spermatozoa which can be collected per 24-hour period from a stallion and is determined by collecting daily for seven days. The number of spermatozoa in the ejaculate after seven days of daily collection reflects sperm output since last collection. The time required for spermatogenesis and epididymal maturation is independent of ejaculation frequency.

TEMPERATURE CONTROL The testes are suspended within the scrotum by the spermatic cord and associated cremaster muscle. The scrotum is a somewhat pendulous sac which has the primary function of maintaining proper temperature for sperm production. Muscles associated with the scrotum (tunica dartos) and the spermatic cord (cremaster) contract during cool weather to draw the testes close to the body to raise testicular temperature. Likewise, during high ambient and/or body temperature, the testes are dropped away from the animal's body to aid in lowering testicular temperature. Elevated testicular temperature, even for a short duration (e.g., 37 degrees Celsius for 24 hours), can significantly lower the number of spermatozoa available for fertilization. Therefore sickness with elevated temperature will result in decreased fertility. Since it takes 65 days for spermatozoa to mature for ejaculation and fertilization, a decrease in fertility will not be seen in a stallion for about two months.

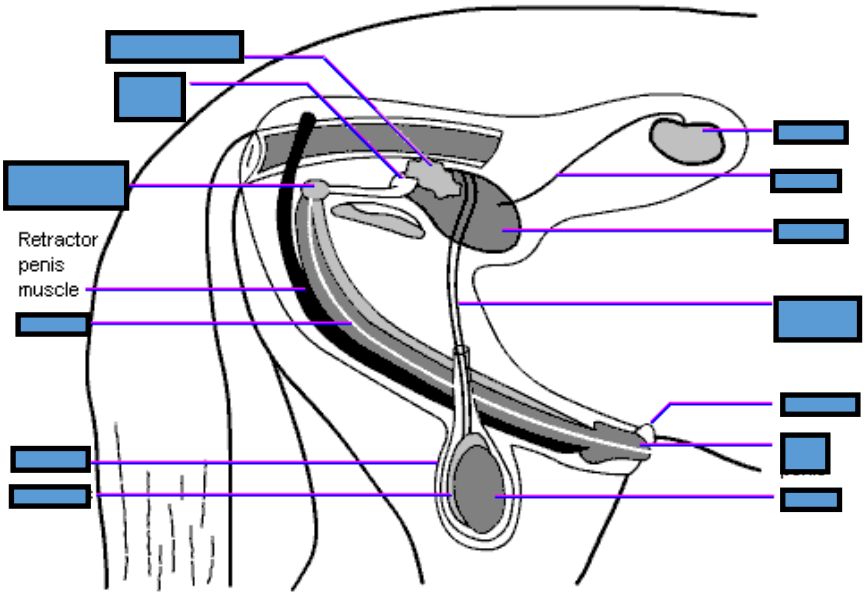
PENIS The stallion's penis is classified as a musculocavernous type, and consists of a root, which attaches the penis to the skeleton; main body (shaft); and the glans penis, which is the free end of the penis.

EJACULATION During ejaculation, spermatozoa are released from the tail of the epididymis and are moved via muscular contractions through the ductus deferens into the pelvic urethra. Spermatozoa are mixed with secretions of the accessory sex glands during ejaculation. Collectively, the secretions and spermatozoa are referred to as semen. The fluid portion, consisting of testicular, epididymal, and accessory sex gland secretions, is called seminal plasma. Semen emitted during ejaculation in the stallion normally occurs in fractions. The first fraction emitted is normally referred to as the pre-sperm fraction. It is generally believed to be of bulbourethral origin, and thought to function in cleansing the urethra. The second fraction is referred to as the sperm-rich fraction. It contains approximately 45 percent of the ejaculate volume, 75 percent of the spermatozoa, and is predominantly of ampullar origin. The third fraction is the sperm-poor fraction and is primarily of vesicular origin. This fraction contains the gel portion which is normally filtered out and discarded during semen collection for artificial insemination.

1. Your stallion has entered the breeding season reproductively sound and was successfully breeding mares. On March 3, he ran a fever of 104 degrees Fahrenheit for two days and went off feed. How will this affect his fertility and when will it become apparent? If problems occur, when will they subside (when will the stallion return to a normal fertility state?)

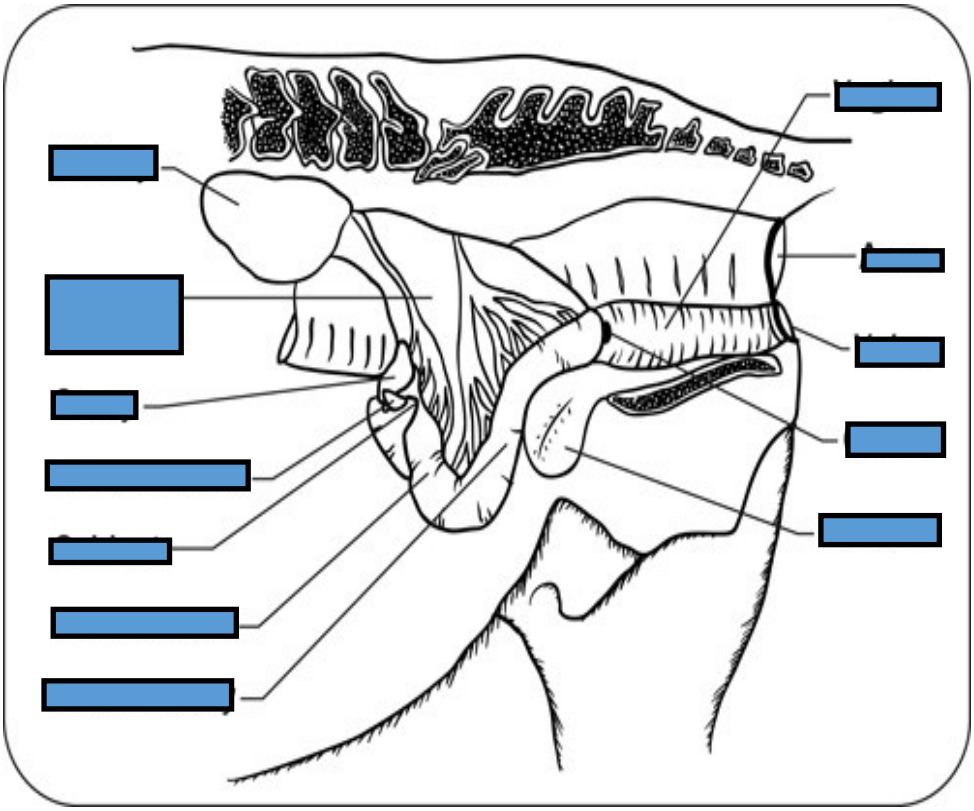
2. A stallion was used to breed 40 mares during the past breeding season. He had a 90 percent conception rate. With a stud fee of $2000.00, how much money did the stallion owner bring in on stud fees alone?

Reproduction in Equine



Label the parts of the male reproductive system with the correct number

1. Kidney
2. Bladder
3. Testes
4. Scortum
5. Epididymis
6. Prostate
7. Seminal Vesicle
8. Retractor Penis muscle
9. Urethra
10. Ureter
11. Pupace
12. Vas Deferens
13. Glans Penis



Label the parts of the Female Reproductive System with the correct number

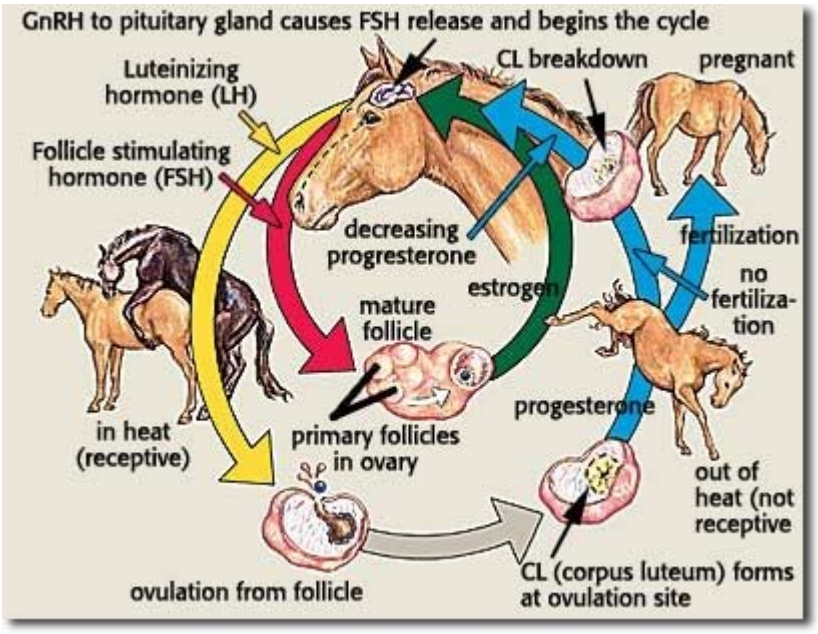
1. Bladder
2. Uterine Horn
3. Vulva
4. Cervix
5. Uterine Body
6. Ovary
7. Broad Ligament
8. Anus
9. Infundibulum
10. Kidney
11. Vagina
12. Oviduct

Horse owners want to breed their mares for numerous reasons. Many owners have a beloved mare from which a foal is wanted, while others manage a large-scale breeding operation as a business. Many others may fall in between this spectrum. Regardless of the reason for choosing to be involved in horse breeding, a working knowledge of the mare's reproductive anatomy and physiology is essential. This knowledge provides the fundamental basis on which all other principles of horse breeding rest.

The mare's reproductive tract lies in a horizontal position within the abdominal and pelvic cavities. It includes the vulva, vagina, cervix, uterus, oviducts and ovaries. Changes in the anatomy or interruption in the function of any section can contribute to reproductive problems.

Estrous Cycle

The estrous cycle in most mares starts to normalize in late April or early May until August - the normal breeding season for horses. During this time, the mare will have an estrous cycle of 21 days (±3 days). The estrous cycle is composed of two phases: the estrous phase (in heat) and the diestrous phase (out of heat). Estrus usually lasts for 6 days, but can be 4-10 days, depending on the mare. Diestrus is normally 15 days, but may vary from 12-18 days. From September through March, very few mares will cycle normally, so conception is more difficult to achieve during these months. Ovulation, the release of the egg from the ovary, can occur at any time during the estrus phase. However, it normally occurs 24-48 hr before the end of the estrus period. Ideally, to maximize the chance of conception, breeding should occur within 12 hr of ovulation. Breeding or insemination of mares, starting on Day 2 or 3 of estrus and continuing every other day throughout the estrus, is a practical means of achieving satisfactory pregnancy rates.



Fertilization

The site of semen deposition in the mare is intra uterine (natural breeding) or the uterine body (artificial insemination). The muscular movements of the uterus and oviduct under the influence of estrogens are responsible for the migration of sperm to the oviduct.

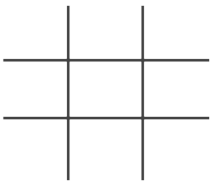
When the follicle ruptures, it releases the ovum to be picked up by the fimbria (infundibulum). The fimbria funnels the ovum into the oviduct, where it comes in contact with the sperm. The union of the sperm and ovum forms the zygote, the beginning of an embryo. The embryo moves down the oviduct to the uterus. The time required to move the embryo from the site of fertilization into the uterus is about 6 days. By this time, the uterus has been under the influence of ovarian progesterone to create a suitable environment for fetal development and implantation.

Studies have shown that the embryo is relatively mobile within the uterus until Day 16 or 17, post-ovulation, because of the increased uterine tone, thickening of the uterine wall and enlargement of the vesicle. Movement throughout the uterus plays a role in the inhibition of the mare's estrous cycle.

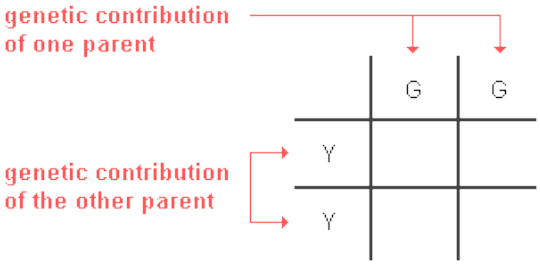
Implantation occurs around Day 35 of gestation and placentation is initiated around Day 40 to Day 45. Up to this time, the fetal sac lies unattached in the lumen of the uterus.

Probability of Inheritance

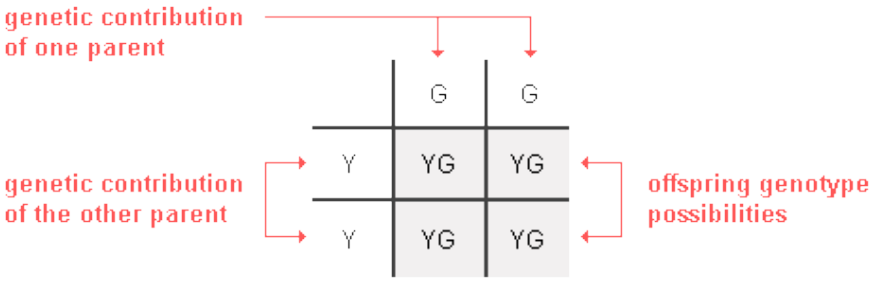
The value of studying genetics is in understanding how we can predict the likelihood of inheriting particular traits. This can help plant and animal breeders in developing varieties that have more desirable qualities. It can also help people explain and predict patterns of inheritance in family lines. One of the easiest ways to calculate the mathematical probability of inheriting a specific trait was invented by an early 20th century English geneticist named Reginald Punnett His technique employs what we now call a **Punnett square**. This is a simple graphical way of discovering all of the potential combinations of genotypes that can occur in children, given the genotypes of their parents. It also shows us the odds of each of the offspring genotypes occurring. Setting up and using a Punnett square is quite simple once you understand how it works. You begin by drawing a grid of perpendicular lines



Next, you put the genotype of one parent across the top and that of the other parent down the left side. For example, if parent pea plant genotypes were YY and GG respectively, the setup would be:



Note that only one letter goes in each box for the parents. It does not matter which parent is on the side or the top of the Punnett square. Next, all you have to do is fill in the boxes by copying the row and column-head letters across or down into the empty squares. This gives us the predicted frequency of all of the potential genotypes among the offspring each time reproduction occurs.



In this example, 100% of the offspring will likely be heterozygous (YG). Since the Y (yellow) allele is dominant over the G (green) allele for pea plants, 100% of the YG offspring will have a yellow phenotype, as Mendel observed in his breeding experiments.

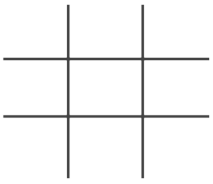
In another example (shown below), if the parent plants both have heterozygous (YG) genotypes, there will be 25% YY, 50% YG, and 25% GG offspring on average. These percentages are determined based on the fact that each of the 4 offspring boxes in a Punnett square is 25% (1 out of 4). As to phenotypes, 75% will be Y and only 25% will be G. These will be the odds every time a new offspring is conceived by parents with YG genotypes.

	Y	G
Y	YY	YG
G	YG	GG

An offspring's genotype is the result of the combination of genes in the sex cells or gametes (sperm and ova) that came together in its conception. One sex cell came from each parent. Sex cells normally only have one copy of the gene for each trait (e.g., one copy of the Y or G form of the gene in the example above). Each of the two Punnett square boxes in which the parent genes for a trait are placed (across the top or on the left side) actually represents one of the two possible genotypes for a parent sex cell. Which of the two parental copies of a gene is inherited depends on which sex cell is inherited--it is a matter of chance. By placing each of the two copies in its own box has the effect of giving it a 50% chance of being inherited.

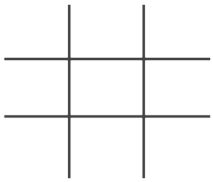
There is a genetic disease in the American Quarter Horse called Hyperkaelmic Periodic Paralysis (HYPP)

You can use a Punnett square to determine what percentage of the offspring of mating a homozygous positive for HYPP (HH) that will be mated with a homozygous negative (NN) How many of the offspring will carry the gene for the disease.



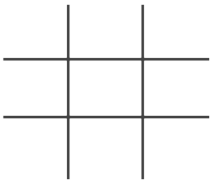
_____

Hint: The sum of all the possible combinations from mating always equals 100 %



_____

In the 2nd punnet square above determine how many offspring would carry the gene if one parent was heterozygous for the disease (HN) and the other was homozygous negative (NN)



_____

In the third square, figure out what would happen if both parents are heterozygous for the disease.

How would you use this information to make decisions if you were breeding a mare?

_____

_____

Managing Horse Waste

A 1000 pound horse produces about 45-50 pounds of manure every day. (That's 10 tons a year!) as well as 9 pounds of urine and 8to 15 pounds of soiled bedding depending on its diet and the owner's management practices. Bedding in stalls is used to absorb wastes, especially urine. A stall must be mucked each day because wet bedding can cause a horse to have thrush, a disease of the hoof, as well as attract flies and contribute to bad odors. Using shavings, sawdust, or rock free sand instead of straw will not only cut down on bulk but also decrease fly breeding. If horse waste is handled properly, it can be recycled and add nutrients to the soil instead of polluting the environment. In this activity you'll find out which bedding absorbs the most horse waste and promotes the fastest decay back into the soil.

Experiment 1

1. Collect from the farm a 1/2 pound sample sample of Straw, wood shavings, sawdust and shredded paper.
2. Divide each sample in half and place 1/4 pound (four ounces) of each material in a separate one gallon bucket or container
3. Pour one quart (4 cups) of water into each bucket and let set for 30 minutes.
4. Cover each bucket with a board and our the excess water into another bucket and measure it.

Straw	Wood Shavings	Sawdust	Shredded Paper
_____	_____	_____	_____

Which has absorbed the most water? _____

Experiment 2

Place each of the of the wet samples as well as 1/4 pound of each sample that is dry outside on piles where they won't get disturbed. After 2 weeks observe which materials have started to decay.

Wet Straw	Wet Wood Shavings	Wet Sawdust	Wet Shredded Paper
_____	_____	_____	_____
Dry Straw	**Dry Wood Shavings**	**Dry Sawdust**	**Dry Shredded Paper**
_____	_____	_____	_____

What would happen to the environment if horse wastes were not disposed of safely?_____

_____

What did you learn by conducting these experiments?_____

_____

What are some other materials that you can use as bedding?_____

_____

An alternative to "disposing" of horse manure is to compost it into a by-product of the operation. Composting occurs naturally if stall waste decomposes in the presence of oxygen and is kept relatively moist, above 50 percent moisture content The microbes that decompose the bedding and manure occur naturally in stall waste. In fact, commercial composters and mushroom substrate preparation facilities often seek straw-bedded horse stall waste. Composting provides a material that is more readily marketable than raw stall waste. Finished compost is partially degraded manure and is more organically stable, presenting less of a pollution threat. Its finer texture, high organic matter content, and fertilizer value make it desirable as a garden soil amendment. Composting reduces the volume of waste by 40 to 70 percent. Horse manure, with its associated bedding, is almost perfectly suited for composting because it has appropriate levels of nitrogenous material and carbon-based bedding material. (The carbon:nitrogen ratio of stall waste is 20:1 to 30:1.) Stables have successfully given away, or even sold, bulk and bagged horse compost. Golf courses and nurseries provide an outlet for truckloads of compost.

Pasture Management

Good pasture management is an ongoing process. It begins with knowing the potential impacts a horse may have on a pasture. These include impacts such as eating grass, pulling out grass roots, crushing and trampling vegetation, wearing trails in the soil, polluting ground water and erosion. Too much of any of these impacts can result in "overgrazing"- the destruction of so many grass roots, that he pasture has trouble growing. To avoid over grazing, basic pasture management principles should be followed.

High quality, pasture represents one of the best and least expensive sources of feed for a horse. In addition, a well-managed pasture can provide the most natural and healthy environment for exercise and rest. Productive, well-managed pastures can provide most of the feed requirements of horses at the lowest cost. In fact, good pasture alone is sufficient to meet most of the nutritional requirements for many classes of horses such as Idle and lightly exercised horses. Yet, poorly managed pastures supply little or no feed, and are frequently the source of many internal parasites, thus supplementation will need to occur.

General guidelines for the pasture area requirements (if the pasture is to serve as a feed source) for horses, which have a mature weight of 450 to 550 kg. Are:

- Mare and foal 1.75 to 2 acres
- Yearlings 1.5 to 2 acre
- Weanlings 0.5 to 1 acre

When acreage is very limited (less than one acre per horse), exercise may be the main use of the pasture. Pasture for this purpose will not supply more than a minimum amount of feed. However, with limited pasture acreage, rotational grazing systems are the most effective method to maximize forage production and consumption. In this system, a group of compatible horses can graze a paddock (area of divided pasture) for approximately 3 to 6 days and then be moved (rotated) to a fresh paddock. Well-limed and fertilized ryegrass or phalaris should be the main grass for this type of area. Phalaris and cocksfoot withstands close and continuous grazing better than most other grasses and when well established and properly fertilized, it produces a reasonably dense and attractive sward.

Turing horses out on pasture creates impacts and effects on the pasture that would not have occurred if horses had never been there. While some impacts are okay, others can be negative. For each category of boxes list potential negative impacts that might happen to a pasture because of a horse.

Mouth	Body	Hooves	Manure

Describe the problem, negative impact and a possible solution for each situation below.

Situation 1: Your cousin has just moved to the country and bought 40 acres and decided to get his very first horse. He contacts you and tells you all about his plan to keep the horse in his backyard, because he thinks it would be nice to pet his horse from his window.

Problem:	**Negative Impact:**	**Solution:**

Situation 2: Your friend built a small, 2 acre pasture and a barn with runs. However the horse is almost never in his run. Instead it spends most of the day in the pasture. After a few weeks, your friend calls you and complains that the horse is eating all the grass in one corner and that it's turning into a dusty mess.

Problem:	**Negative Impact:**	**Solution:**

Why is it important to know the potential negative impacts a horse can have on a pasture?

_____

_____

What potential impacts do you have on your environment? _____

_____

What can you do to boost your good impacts on your environment?_____

_____

_____

Ethics and Etiquette

The dictionary defines ethics as "the study of human conduct, with emphasis on the determination of right and wrong." Ethics are concerned with voluntary actions; that is, the things you choose to do. The decisions you make regarding your horse and showing events affect how others view you, and reflect on your club, your county, and the 4-H Program as a whole. Be sure the decisions you make are ethical ones.

To help determine whether what you are doing is ethical, ask yourself the following questions:

- Will I need to lie about this?
- • Does this harm the horse?
- • Is this against any rule?
- • If someone were watching me, would I not do this?
- • Does this misrepresent me or the horse?
- • Would I be unhappy if someone did this to me?

If the answer to any of these questions is "yes," don't do it. It is not ethical. To maintain your integrity and that of the 4-H Horse Program, follow these guidelines:

1. Obey the rules. Rules are made for a reason, and they are meant for everyone to follow. Don't look for loopholes or ways to bend or stretch the rules. Play fair. Be sure you know the rules of the show, your county, and your state.
2. Be honest. Any time you have to lie, you are being unethical. Don't lie, and don't do anything that you would later want to lie about or hide.
3. Take proper care of your horse. Make sure your horse has adequate food, water, and shelter and keep it in good health with correct grooming, parasite control, vaccinations, foot and dental care, and basic safety. Proper care also means that you use humane training methods. Any mistreatment or abuse is unacceptable and will not be tolerated by the 4-H Program.
4. Demonstrate good sportsmanship. Good sportsmanship is a part of being ethical. Be gracious and courteous whether you win or lose. Help others who are in the competition with you. Don't run down other members, and don't blame the judge for your performance. Never blame your horse if you don't do well. Jerking on the reins or spurring the horse in anger are poor images to project of yourself and 4-H. Your attitude is important not only in the show ring, but in all aspects of life.
5. Keep competition in perspective. Winning is not the main goal. Rather, strive to do your best, to learn, and to grow. Compete against yourself and the course instead of other members. Have fun. If you don't enjoy what you are doing, maybe this isn't the right activity for you. 6. Maintain proper adult involvement. Remember that the main goal of 4-H is youth development. Parents and other adults are there to help and teach you, not to do your work. Help them to focus on what is best for all the kids and the program, not just on you. Do as much as you can yourself.

WHEN I COMPETE, I have a performance goal…never a goal "only to beat someone else." I respect and learn from other competitors more skilled than myself. I don't criticize other competitors, officials, or judges. I do my best today. I have fun.
I stay home if I can't follow the above rules.

Warm-up Arena Etiquette

At a horse show, you'll have opportunities to use warm-up space. The warm-up ring is usually overcrowded, so following these simple rules can help make it a safer and more beneficial place.

- All horses work in the same direction.
- Trainers, leaders, and helpers remain outside the arena.
- Don't mix lunging and riding in the same arena.
- Don't mix carts and mounted horses in the same arena.
- If you ride a mule, donkey, or pony, remember that some horses are not familiar with these kinds of animals and may be frightened. Be respectful and careful when warming up together.
- Don't cut others off into the rail or crowd the rail, moving others off.
- Communicate with those around you, especially if you are having trouble.
- Do not halt and/or back up without warning those around you.
- Keep two horses' lengths between you and the horses to the side, front, and back.
- Be in control; if you're not, you're not ready to be there.
- Keep your language and comments appropriate.
- The 4-H Code of Conduct applies at all times.

In the Show Ring

Remember that all contestants are doing their best to be seen by the judge. Be respectful of the riders around you. Adhere to the same guidelines in the show ring as in the warm-up arena, and add the following:

- Don't try to "squeeze" into a space in line where there isn't space.
- Don't be afraid to enter the arena first.
- When working a pattern, stay away from those who are lined up whenever possible.
- Be ready and waiting for the judge's signal for you to begin.
- Wait for the judge to acknowledge you before you begin your pattern and before returning to line when you finish your pattern, unless the judge requests otherwise.
- Be sure your exhibitor number is clearly visible.
- If you are too close to another exhibitor, don't hesitate to circle safely and find your own space on the rail.
- Do not dismount in riding classes.
- Ask a steward or judge for permission if you want to be excused.
- Be sure your horse is prepared for the horse show environment (clapping, chairs moving, people climbing bleachers, and so on).

Behavior and Training

How are horse behavior and training related? Horse behavior results from genetic influences and learned interactions with the environment. In general, behavior of horses can be categorized into 11 areas. Understanding these 11 behavioral categories helps trainers and riders interact with horses. The senses of vision, hearing, smell and touch influence how a horse interacts with its environment and how a horse learns. Training is a process of teaching the horse to respond to cues. This begins when the foal is still at the mare's side.

NORMAL BEHAVIOR

Some of horse behavior is genetic -- a part of their built-in programming of how they interact with their environment to maintain themselves and to survive. The other aspects of behavior are learned as horses respond to their environment. Horse behavior can be categorized into these 11 categories:

1. Reactive behavior
2. Ingestive behavior
3. Eliminative behavior
4. Sexual behavior
5. Care-giving and care-seeking behavior
6. Agonistic behavior
7. Mimicry behavior
8. Gregarious behavior
9. Investigative behavior
10. Grooming behavior
11. Sleep and rest behavior

Reactive behavior: Reactive behavior is a classification of activities used by an animal to keep themselves in harmony with their environment and to adjust to sudden potentially harmful situations. One form of reactive behavior is a simple reflex -- for example, a limb withdrawn in response to a local pain. Communication and vocalization are also forms of reactive behavior. Another indication of reactive behavior is shelter-seeking in hot or cold weather.

Ingestive behavior: Ingestive behavior includes eating, drinking, preferences for food, daily patterns of feeding, the process of obtaining food, and chewing food. Horses in a pasture eat small amounts of feed throughout the day. Horses kept in a stall or corral eat at the convenience of the owner or handler. Feeding behavior is influenced by learned patterns and preferences, palatability of the feed, the environment, and social associations. Horses use their molars for chewing before swallowing, whereas cattle ingest large quantities of food with minimal chewing.

Eliminative behavior: Eliminative behavior refers to urination and defecation. While urinating, all horses have the same characteristic stance. Horses are often reluctant to urinate on a hard surface because the urine splatters on their legs. Horses will defecate while they are moving. In a stall, horses often have no particular place to defecate. In pastures, horses tend to deposit their urine and feces in certain areas and graze in other areas.

Sexual behavior: Sexual behavior involves courtship, mating and maternal behavior. It is controlled by hormones and some of it may be learned. The stallion's courtship behaviors prepare him for mating. It is characterized by neighing, smelling and pinching of the mare with its teeth by grasping the folds of the skin in the loin-croup area. Mares in heat show external signs including frequent urination and lifting the tail sideways. Also, a mare in heat will allow the stallion to bite and smell her.

Care-giving and care-seeking behavior: Giving care or attention is very common in horses. Horses seek attention and care from each other. This is displayed when horses stand head to tail and mutually swat flies for each other and when they use their incisor teeth to nibble areas including the base of the neck, withers, back and croup during mutual grooming. Horses also signal for care and attention. This type of behavior is also called epimeletic behavior. It is most often seen when horses are separated from each other. For example, a young foal separated from its mother will nicker or whinny for her.

Agonistic behavior: Agonistic behavior includes fighting, flight and other reactions associated with conflict. Aggression establishes the dominance hierarchy for horses kept together. Hierarchy is established by some characteristic behaviors when they approach each other. Some examples include heads high, tossing heads and arched necks with ears pointed forward. The face-to-face encounter is made by smelling or exhaling at each other's nostrils. They may squeal, rear up and threaten to strike during this face-to-face encounter.At some time during a first encounter one horse may decide to turn its hind end around to the other horse and kick with one or both hind legs. Once the dominance is established, only threats of aggression are necessary to maintain the hierarchy. Penning new horses separately in an adjacent area can reduce the initial aggressive behavior. This requires strong, high, safe fencing. Horses kept together from a very young age seldom fight.

Mock fighting is a variation of play. This activity is especially observed in young colts.

Mimicry behavior: Horses learn to copy the behavior of other horses at a very young age. This is called mimicry or allelomimetic behavior. Horses moving toward water and crossing a pasture display allelomimetic behavior. As one horse starts toward the water, others follow. This type of behavior is closely related to gregarious behavior.

Gregarious behavior: Horses show a definite preference to be near other horses. This behavior can be beneficial on trail rides and in group activities, but a disadvantage when riding or trying to work a horse alone. Horses are gregarious in nature. This tendency has practical implications. Wild horses in the center of the herd were safer from attack.

Investigative behavior: Horses like to explore and investigate a new environment. This curiosity subsides once the environment becomes familiar. If any change or novelty is introduced, investigative behavior reappears. Horses use the senses of sight, hearing, smelling, tasting and touching to investigate. Foals are more curious than older horses.

Grooming behavior: Besides mutual grooming, horses also groom themselves. Horses will paw a dry area and lie down and roll on their backs. When the horse gets up it will shake its whole body. To cause bothersome insects to fly away, horses will rapidly contract superficial muscles on the trunk and forelegs, use their heads to remove insects, use the hind leg on insects on the belly, or use the tail to swat at flies on the hindquarters.

Horses often relieve itching by rubbing against some fixed object. On some areas of the body a horse will use the head or hind foot to scratch or bite an itch.

Sleep and rest behavior: Rest and sleep allow the horse to restore its physiological status. During sleep the body makes metabolic recoveries in a short time. During rest the body conserves energy. During rest the animal may be drowsy but wakeful. The horse rests while standing. Horses sleep standing up, but of course they can and do at times lay down to sleep. When they sleep standing up they have a system of tendons and ligaments called the stay apparatus. This allows them to "lock" their legs and relax their muscles without falling over. In the course of a 24-hour day, the horse is alert and active about 19 hours. It spends almost 2 hours in a drowsy, resting state. So the horse is awake about 21 hours a day. The horse actually sleeps in a deep sleep (brain sleep) for about 3 hours a day.

ABNORMAL BEHAVIOR Horse owners, trainers and riders need to learn the normal patterns of behavior so they can recognize abnormal behavior.

Examples of abnormal reactive behavior in horses can include:

- Weaving
- Head nodding and shaking
- Pacing and pawing (stall walking)
- Self-mutilation
- Tail rubbing
- Halter pulling
- Kicking and biting
- Destructive behavior
- Dog-sitting (sitting like a dog)

Examples of abnormal ingestive behaviors include:

- Cribbing
- Tail biting
- Tongue dragging
- Wind sucking
- Wood chewing
- Eating feces, hair or soil

LEARNING -Training involves learning to make a desired response. These responses can be chained together into maneuvers. Responding to a stimulus that is learned is called a conditioned response. These are used in horse training. A stimulus used to train horses is called a cue.

Cues:

Horses must learn cues. Trainers start with the cues that are the closest to being natural. For example, while maintaining balanced weight in both stirrups, leg cues are the most crucial. As the horse learns the basic cues, the trainer will advance the horse to new cues. The rate of learning depends on the individual horse and the clarity of how the old cues are paired with the new cues. Cues must be very specific.

Reinforcement:

Reinforcements strengthen the response to certain stimuli. Feed is a primary reinforcer, but very few primary reinforcers are used in training. Secondary reinforcers such as acts of kindness like a soothing voice, or rubbing a horse's neck are used in training. Response to secondary reinforcers is learned.

Reinforcement is either positive or negative. Positive reinforcement is sometimes called reward training. Negative reinforcement, such as some type of punishment, means the horse will respond to avoid or get rid of the stimuli. For any reinforcement to be effective, it must be immediate in relation to the response.

TRAINING

Training begins while the foal is still on the mare (nursing). Handling and teaching it to lead at this young age will help develop a more dependable horse through the years. Halter breaking is not difficult if done correctly while the foal is young.

Communication or cues of rider to horse are accomplished through voice, legs and hands. Voice cues for starting and stopping are easy to give and easily understood by the horse. Rein cues are more complex for both rider and horse. Leg cues are needed for most complex responses. Horses are sensitive to insecurity or confidence in their riders, and respond accordingly.

Numerous books, videos and workshops are available on the subject of breaking and training horses. Many people have their own methods and their strong opinions.

IMPRINTING

During the first 48 hours after birth, handling and accustoming the foal to human hands and stimulus has been shown to psychologically prepare the foal for later handling. This imprinting of human contact is most effective if done within the first 24 hours of the foal's life. Handling the foal's feet, muzzle, ears, rectum and girth help prepare the foal for later when it is necessary to pick up the feet, clip the muzzle and ears, pass a stomach tube, take temperatures, and tighten the saddle.

SENSES

How an animal behaves is influenced by the senses of vision, hearing, touch and smell. The horse uses these senses to interpret and respond to its environment and training.

Vision:

With the placement of the eyes on the sides of the head, horses have a field of vision that is approximately 220 degrees, allowing them a panoramic view. The only real blind spots are directly behind and directly in front. Since horses are capable of monocular vision (independent viewing) from each eye, they often shy at an object just past when heading in a different direction. For binocular vision a horse must force its eyes forward. Binocular vision is limited to 60 to 70 degrees.

A horse's eyes have a ramped retina. This means the retina is closer to the lens than other parts. The horse adjusts its range of vision by lowering and raising its head, like a human with trifocal glasses. The vision of a horse is convenient for grazing and watching for enemies at the same time, but it is a real handicap in judging height and distance.

Hearing:

Horses have good hearing because of rotating ears on movable heads and long necks. The eyes and the ears work together. The ears will point toward a sound so the horse can hear it better. Then the horse will try to see what is making the sound. Horses can hear high-pitched tones out of range to human ears.

Touch:

The skin of the horse contains sensory organs for hot or cold, hard or soft, or sensing pain. Areas of most sensitivity in horses seem to be in the mouth, feet, flanks, neck and shoulders. Horses vary greatly in skin sensitivity, but they still enjoy being groomed.

Smell:

Horses have a good sense of smell. Domestic stallions can identify mares in heat for great distances downwind. Because of their sense of smell, colts being saddled for the first few times should be allowed to smell the saddle and the blanket before saddling. This reassures them that the items are not dangerous and that they have been used by other horses.

READING HORSE BEHAVIOR

Horse psychology attempts to anticipate possible behavior of the horse under a variety of conditions and then tries to provide a comfortable condition that will calm and encourage the horse to respond correctly to the handler. Unmanageable situations can often be avoided by reading the emotions of a horse. As an example, ears pinned backward indicate anger or a warning. A good reader of horse behavior also recognizes that horses sometimes fake anger in an attempt to bluff and scare.

Ears forward show interest or suspicion. Some horses show interest in everything they see in new surroundings without seeing anything fearful to be avoided. Others keep their ears forward and eyes open, afraid of a sudden attack.

Eyes and nostrils show emotion and reflect temperament. Dilated nostrils reflect interest, curiosity or apprehension. When the eyes flash, nostrils dilate and muscles tense, the horse is likely to react.

Riders who read their horse's emotions accurately can often steady the horse with reassuring words or exercise control through appropriate hand, leg and upper body connection.

MEMORY AND INTELLIGENCE

Horses have a good memory. This is one of the reasons they are so useful to humans. A well-trained young horse never forgets its training. Neither does the poorly trained one. Bad habits should be recognized and corrected before they become fixed in the memory.

Some horses may be considered very intelligent because they can open most gates and doors on the farm. Idle horses tend to seek activity, some of which may involve gate latches. Once they succeed, their good memory keeps them trying to open doors. However, their intelligence does not mean they have an association between an action and a consequence. When they get the grain bin open, they remember only the joy of eating but they cannot associate overeating with the resulting colic or loss of hooves from founder.

1. Horse behavior results from _____ influences and from learned interactions with the _____ .

2. Identify the 11 categories of horse behavior described below. Choose from these categories:

Agonistic	Care-giving and care-seeking
Gregarious	Grooming
Eliminative	Ingestive
Investigative	Mimicry
Reactive	Sexual
Sleep and rest	

a. Activities used to keep an animal in harmony with the environment and to adjust to potentially harmful situations:

b. Eating, drinking, food preferences, feeding patterns, obtaining food and chewing food:

c. Urination and defecation:

d. Courtship, mating and maternal behaviors:

e. Seeking attention from other horses:

f. Fighting, flight and other reactions associated with conflict and the dominance hierarchy:

g. Copying the behavior of other horses:

h. The preference of horses to be near other horses:

i. The curiosity to explore and investigate a new environment:

j. Includes behavior such as rolling, shaking, tail swatting or scratching:

k. A period for the animal to restore its physiological status:

3. A stimulus used to train horses is called a _____ .

4. Handling a foal during the first 48 hours after birth so it will be accustomed to human hands and stimulus is called _____ a foal.

5. Horses have a _____ view and are capable of _____ vision (independent viewing) from each eye.

6. Ears forward show _____ or suspicion, while ears pinned backward indicate _____ or a warning.

Education Center

Cornell University
Cooperative Extension
Cattaraugus County

Education Center
28 Parkside Drive
Ellicottville, NY 14731
t. 716-699-2377
f. 716-699-5701

cattaraugus.cce.cornell.edu

4-H Youth Horse Program

COMMITMENT TO EXCELLENCE

- I believe that participation in the 4-H Horse Program should demonstrate my own knowledge, ability and skill as a caretaker and exhibitor of equines.
- I will do my own work to my fullest extent that I am safely capable and will accept advice and support from others.
- I will not use abusive, illegal, fraudulent, deceptive or questionable practices in the feeding, fitting and showing of my animal(s), nor will I allow my parents or any other individuals to employ such practices with my animal(s).
- I will read, understand and follow the rules put forth by the Cattaraugus County 4-H Horse Program, without exception, for all horse shows in which I am a participant, and I will ask that my parents and supervisors of my project do the same.
- I wish for my horse project to be an example of how to accept what life has to offer, both good and bad, and how to live with the outcome.
- I realize that I am responsible for:
    1. The grooming, and care of my project animal(s),
    2. The proper care and safe, humane treatment of my animal(s),
    3. The safe handling of my animal(s) at all times,
    4. Demonstrating strong moral character as an example to others.
    5. Supporting and respecting all the youth and volunteers at any and all 4-H events

_____ _____

4-H Youth's Signature Date

_____ _____

Parent/Guardian Signature Date

_____ _____

4-H Educator's Signature Date

NYS 4-H HORSE CERTIFICATE

____ Personally owned

____ Family owned

____ Non-owned
(See non-ownership policy/reverse side)

Date _____ 20____

Name of Animal

Date Animal Born (Mo.) (Day) (Yr.) Sex M ☐ G ☐

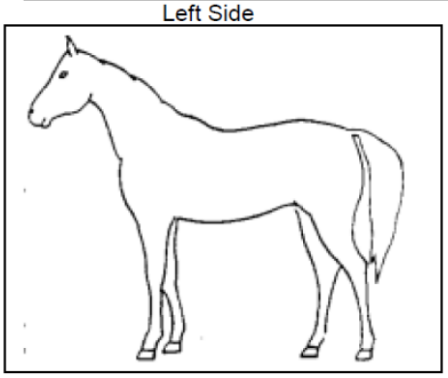
Name of Sire

Name of Dam

Registry/Breed Reg. No.

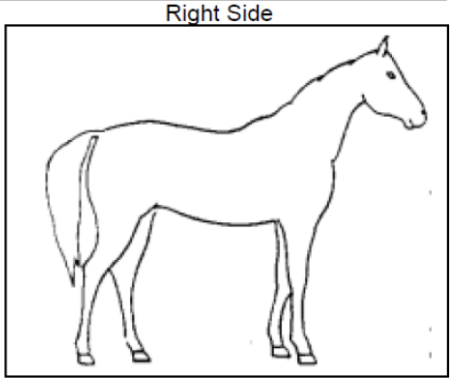
Date of Purchase Member County

Left Side



Draw markings on each side and face identical to your horse

Right Side



Color Owner

Height Address

Weight

(Zip)

Signature of Owner

This animal has been officially designated as the 4-H project animal of the 4H'er as of June 1 of the current project year.

Name of 4-H'er _____

Address _____

_____ Zip _____

Telephone _____ Email _____

_____
Member's Signature

Parent/Guardian _____

Address _____

_____ Zip _____

Telephone _____ Email _____

_____
Parent/Guardian Signature

4-H Leader Name _____

Address _____

_____ Zip _____

Telephone _____ Email _____

_____
Leader's Signature

Educator _____ County _____

Address _____

_____ Zip _____

Telephone _____ Email _____

_____
CCE Educator Signature

Remember to include a copy of your current Coggin's test - test dated this year or last year. *Proof of rabies vaccination required - must he current, given more than 14 days prior to arrival at fairgrounds, and remain current for duration of the Fair.

See reverse side for important information