DEPARTMENT OF Animal Science

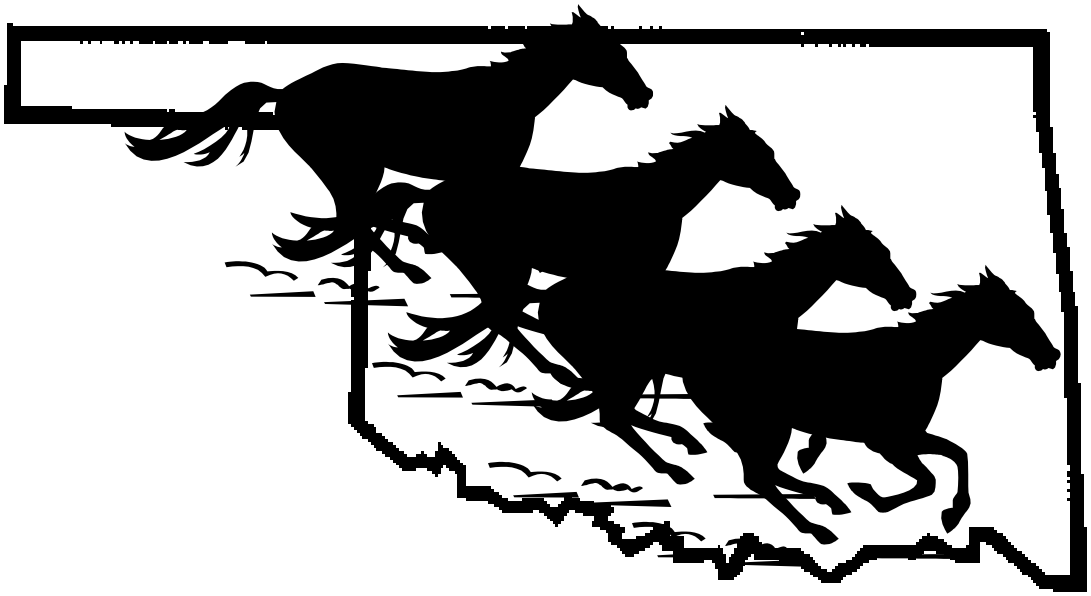
4-H Youth Development

Oklahoma 4-H Horse Project

Member Activity Manual

Four

4-H-ANSC-606



Member Activity manuals were prepared originally by Dr. David Freeman, Extension Equine Specialist, and Dr. Sheila Forbes, Youth Development Specialist, Oklahoma State University, Stillwater, OK., and have since received revisions in 2004 and 2010 by Dr. Freeman, Meriruth Cohenour, 2004 Undergraduate Student Program Aide, and State Development 4-H Youth Specialists.

OKLAHOMA HORSE PROJECT MEMBER ACTIVITY
MANUAL FOUR

The Horse Project Member Development manuals contain a progressive series of elective activities intended to provide a framework for youth development in the horse project. The manuals require direct supervision and teaching by a 4-H Horse Project Leader. Completion of the manuals requires written accounts of activities, oral and written responses to questions and demonstrations of practical expertise.

Although not required for membership, all new 4-H members in the horse project should be encouraged to complete activities in manual one. This will provide the member and leader direction for 4-H programming in the horse project. Members should use their own project horse for completion of necessary tests. Leaders should alter the requirements for riding if a member does not have a project horse or does not have a suitable animal to complete a specific task. Youth should advance as interest and abilities dictate with no definite time schedule.

Completion and Participation Requirements

Minimum age suggestion for completing the series are as follows: Manual One, 9 years; Manual Two, 11 years; Manual Three, 13 years; and Manual Four, 15 years of age. The manuals are designed to be completed as a progressive series. Ideally, the higher numbered manuals should not be started until completion of lower phases. However, those members starting the program that meet the age requirements of Manual Two or above may complete lower numbered concurrently with the manual for their minimum age for completion.

This project requires detailed inspection and direction at the local level. Leaders will need the involvement and participation of parents, knowledgeable horse persons, and other resource people for successful programming.

Leaders and extension educators can modify the manuals in efforts to increase the program effectiveness for each member. The manuals are intended to establish a **minimum** level of skills and demonstration of knowledge. Additional activities are encouraged.

Each manual is divided into three parts. Part one requires members to report their participation at horse events and 4-H activities. Part two is intended to increase members' knowledge of the horse industry and their expertise in horsemanship, management and horse evaluation. The final part allows for evaluation of the project.

Recognition programs directed at the local level are strongly encouraged to enhance participation and recognize accomplishment. Manuals One, Two and Three should be reviewed for completion by the 4-H leader and local Extension Educator with 4-H responsibility. Manual Four should also be reviewed for completion by a State Specialist with responsibility with 4-H horse project responsibilities.

Member's Name _____

Date Member completed Manual Three _____

Date Member began this manual _____

Part I. Are You an Active 4-H'er?

1. Report the Number of Hours you Spent riding, grooming, feeding and otherwise caring for Your Project Horse(s) *(Record your daily totals on a calendar and write monthly totals below)*

Month	***Riding***	***Grooming***	***Feeding***	***Other Care (Cleaning stalls, exercising, etc.)***
January				
February				
March				
April				
May				
June				
July				
August				
September				
October				
November				
December				

2. Which month did you accomplish the most in advancing the training of your horse?

3. What type of training, exercise or groundwork were you most able to accomplish? How does this compare to your thoughts when asked in the previous manual?

4. What type of training, exercise or groundwork was the hardest to accomplish? How does this compare to your thoughts when asked in the previous manual?

5. List the date of at least five horse shows, trailrides or other events you participated in with your horse. Also, list something you felt was a big accomplishment you gained from the activity.

Date	*Name of Event*	*Accomplishment*

6. List the date of at least five clinics, tours or demonstrations on horse management, use and care that you attended. List something you learned that you plan to use with your project. Must attend at least one activity each on management, horsemanship and judging.

Date	*Name of Event*	*You Learned*

7. List at least two offices and/or committees you chaired as part of your local 4-H club or other youth clubs.

8. List at least one community service project you organized and led as part of your local 4-H club or other youth clubs.

9. List at least two demonstrations and/or clinics you gave to other youth on horse management or use.

10. Describe one way you aided with the publicity of a 4-H activity to non-4-H participants.

11. List the date, name and location of at least two 4-H functions other than those within the horse project that you attended at the county, district or state level.

Date	Name of Function	Location

12. List two or more 4-H projects you participated in other than the 4-H horse project.

13. List the year or years during which you have served as a teen leader.

14. In your own words, list what you think are the objectives of a 4-H horse project. Would you recommend 4-H involvement to other youth? Why or why not?

Part II. How is your ability with horses?

1. Complete the following activity to test your teaching and technical skills of training a young horse.

   With the help of other members, your leader and other resource people, plan and conduct a skill-a-thon that emphasizes testing of skills related to training young horses. (A skill-a-thon is a series of testing stations where participants try to complete a task or question regarding a practical skill.) Develop at least four different 'learning stations' that participants will move around to test their knowledge. Topics of tests can include a variety of items. For example, have participants demonstrate methods used to teach a foal to lead (Use an older, broke horse so activity can be safe and participants can show their skills without undo interference from the horse). Other ideas include tying properly, picking up and cleaning feet, saddling, longeing, driving, mounting and dismounting (if participants have past riding experience). Again, use of an older, broke horse will be beneficial. You can combine practical skill demonstrations with equipment identification, and questions on management and health. Give clear, precise objectives for each station. For example, ask the participants to safely tie a horse. Several 'testing' points should be identified so each station can have a clear basis for the test. Decide how you will review with the participants to insure that they learned the important points of each learning station. Answer the following questions.

   a. Planning. How many stations did you prepare? List the problem you want participants to solve at each station. How are you going to emphasize hands-on learning?

b. Doing. Did you allow the participants to try the activity before being told how to accomplish the activity? Did you provide enough supervision to make sure the practices were safe for the participants and horse?

c. Evaluating. What went well? What part of the activity did the participants enjoy the most? What problem did the participants handled most efficiently? What problem did they have the most difficulty with? Were their difficulties because of limited technical expertise or because of the way you designed the activity? What would you do differently if conducting this 'skill-a-thon' again?

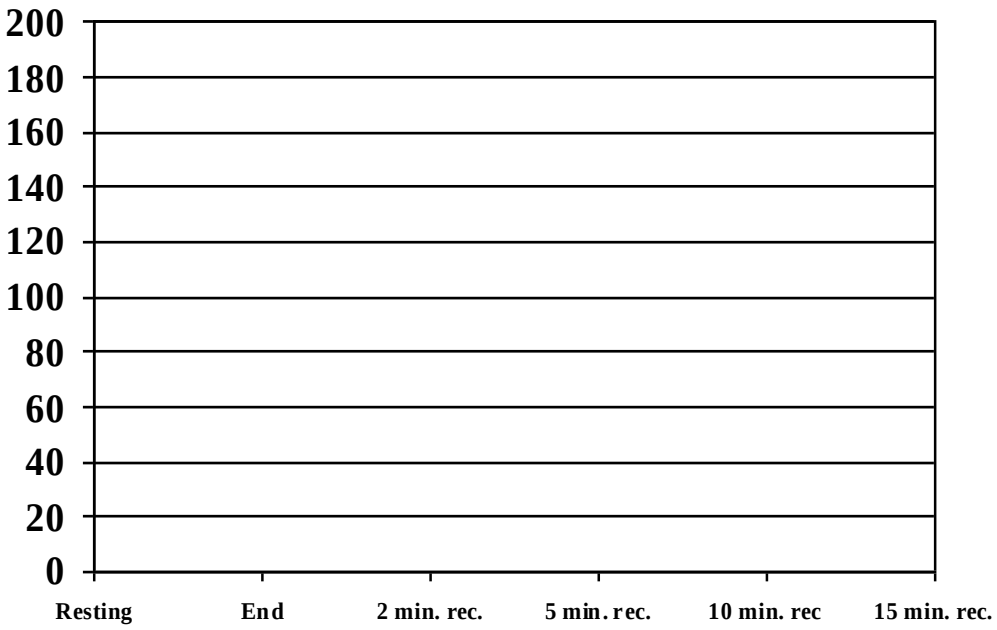
d. What is one item you learned about your teaching abilities while completing this activity?

2. For this activity, you will need to be able to estimate heart rate by using a stethoscope to count heartbeats or by counting the pulses of blood that pass as you apply small pressure on an artery. Your veterinarian can show you where to listen for heart sounds and where to feel pulse rates (There is an artery that passes under the jaw that is a good place to take pulse rate). You will also need a helper with a stopwatch or watch with a second hand. You will also need a horse and rider to perform exercise at a trot and lope.

   First, obtain a resting heart rate. Because heart rate will go up when a horse is excited or exercised, it is best to take this measurement before the horse is tacked and when the horse is quiet. Take this measurement by counting pulses or beats for 15 seconds. Multiply your measurement by four to obtain beats per minute. Then tack up the horse. Make sure that the horse you use has been ridden enough to be able to lope for four minutes without fatiguing. If you are using the same horse, give the horse time for complete recovery from the first experiment before beginning the second. Fill in the following chart by obtaining measurements the same way as you did for resting heart rate.

Experiment One		***Experiment Two***	
Time of measurement	**Heart Rate (beats/minute)**	**Time of Measurement**	**Heart Rate (beats/minute)**
Resting		Resting	
After Mounting, Before any Exercise		After Mounting, Before any Exercise	
Immediately after Rider Trotted Horse for Four Minutes		Immediately after Rider Loped a Horse for Four Minutes	
After two minutes of Standing or Slow Walking Following the Trotting Exercise		After two minutes of Slow Walking Following the Loping Exercise	
After five minutes of Standing or Slow Walking Following the Trotting Exercise		After five minutes of Slow Walking Following the Loping Exercise.	
After ten minutes of Standing or Slow Walking Following the Trotting Exercise		After ten minutes of Slow Walking Following the Loping Exercise	
After 15 minutes of Standing or Slow Walking Following the Trotting Exercise		After 15 minutes of Slow Walking Following the Loping Exercise	

Secondly, chart your results on the following graph. Use of a computer to develop a graph is recommended. Draw or generate via computer a line representing heart rate of the trotting horse and another line representing heart rate of the loping horse. The values on the y axis should be in beats per minute.



3. What heart rate response would you expect from a horse that was in better physical condition?

4. What heart rate response would you expect from a horse that was in lower physical condition?

5. Why would knowledge of heart rate responses be of interest to trainers of racehorses?

6. Sketch a curb bit (bit with shanks) and a ring snaffle bit, identifying the following parts if applicable to the bit: upper shank, lower shank, ring, mouthpiece, port, and curb.

7. Identify at least five different places a curb bit can apply pressure on or around the mouth when rein pressure is applied.

8. Identify at least two different places a ring snaffle bit can apply pressure on or around the mouth when rein pressure is applied.

9. Identify what the following designs of a bit would do to the intensity (more, less, no effect) and placement of rein pressure.

    Longer length of lower shank in relation to upper shank length:

    Smaller diameter mouthpiece of a ring snaffle:

    Twisted or rough texture of mouthpiece:

    Straight, solid mouthpiece with no port:

    Wider port:

    Tighter curb strap:

10. Explain the difference in action and use of bosal hackamores and mechanical hackamores.

11. Identify the difference in action and use of a standing martingale (tiedown) and a running martingale.

12. Define the following terms related to training responses.

    Flexion

    Collection

    Supple

13. List your training suggestions to help cure the following vices or training problems:

    Horse that won't walk

    Horse that won't back

Horse that rears

Horse that won't pick up the left lead

Barn Sour Horse

14. Demonstrate Your Horsemanship Diversity.

Test	*Date*	*Signature of Leader*
Demonstrate the ability to accomplish at least five of the following under expert supervision:		
Western Trail Class or ride Western on a Trailride		
Ride a horse in Saddle Seat Saddle		
Hunter Hack or ride in Hunt Seat on a Cross Country Hunt Trail		
Packing and Ponying a Pack Horse or Mule for Camping		
Competitive Trail Ride Horse on Competitive Trail Ride		
Dressage Horse completing a lower level dressage test		
Cowhorse penning a small group of cattle into a small pen.		
Gaited horse at two different gaits.		
Rope horse (rope a calf-breakaway).		
Ground drive a young horse in a snaffle with long lines.		
Mount and dismount a 'green' horse or Pony a young horse		
Ride a horse in a Race Saddle		
Ride in an arena speed event (pattern run good fashion)		

15. Visit a farm with groups of horses (may want to compare groups of older and younger horses) housed in large pastures. With the assistance of the farm manager, place an object that the horses are not used to seeing in the middle of the pasture (don't place it near a fence or in a corner as horses may run from it when first seeing it). Use something that will not injure the horses if they paw or run over it (a plastic or paper bag, bed sheet, brightly colored ball or a light colored cardboard box are suggested examples). Observe the horses from a distance and note their behavior when they see the object. Was one horse more curious than another? What actions did you observe among the different horses?

16. With the assistance of your County Extension Educator, prepare and send the following to testing laboratories.

Hay Sample:

Date Sent: Date Results Received:

Hay Type:

Tests Requested:

Test Results:

Soil sample:

Date Sent: Date Results Received:

Soil Type:

Tests Requested:

Test Results:

17. Identify health problems that can happen when horses consume the following:

    Fescue Hay

    Sorghum pasture

    Acorns

    Sand

18. Compare the following types of feed by completing the following table. Use a feed source text or information sheet that lists the expected concentration of the following feeds.

Feedstuff	***Digestible Energy (Mcal/lb)***	***Crude Protein %***	***Calcium %***	***Phosphorus %***
Alfalfa Hay (mid-bloom)				
Prairie Hay				
Oats				
Corn				
Soybean Meal				
Ground limestone				
Dicalcium phosphate				

19. Using the information in the previous question, calculate the expected nutrient concentration of the following feed mix: 1100 pounds of oats, 800 pounds of corn, 90 pounds of soybean meal, 6 pounds of ground limestone and 4 pounds of dicalcium phosphate.

	Digestible Energy (Mcal/lb)	***Crude Protein %***	***Calcium %***	***Phosphorus %***
Final Grain Mix				

20. Using the information in questions 18 and 19, calculate the expected nutrient content of combining 10 pounds of prairie hay with 8 pounds of the grain mix.

	Digestible Energy (Mcal/lb)	***Crude Protein %***	***Calcium %***	***Phosphorus %***
Final Grain-Hay Mix				

21. Conduct the following experiment to see what the best solution for storing feed might be.

    Collect samples of three different grain sources fed to horses. Choose from available sources of pelleted feeds, sweet feeds and single grains. Collect enough of each grain mix so you can further divide each mix into three one-cup sub-samples. Place the one-cup sub-samples into plastic zip-lock sandwich bags. Label each bag clearly. By doing so, you should have 9 individual bags of grain mixes, three bags of each mix.

    Organize three different sets, which contain one sample each of the three grain sources. Prepare a sample within a set under the following conditions.

    Set 1. Control Group. Label as controls. Store the three samples in a clean, dry, cool place. Do not cover samples or seal the bags.

    Set 2. Wet/Dark Samples. Label as wet/dark. Cover with water, drain excess water, seal, and store in a clean, dry, dark (no light) place.

    Set 3. Wet/Sun Samples. Label as wet/sun. Cover with water, drain excess water, seal and store in the sun.

    Examine the samples at day two, five, seven and ten. Record your findings by preparing and completing the chart for each grain source as presented below.

Grain Source:

Sample	*Day Two*	*Day Five*	*Day Seven*	*Day Ten*
Control Appearance Smell Texture				
Wet/Dark Appearance Smell Texture				
Wet/Sun Appearance Smell Texture				

Discuss the following questions regarding your findings with your local Cooperative Extension Educator and leader. Provide answers to the following questions.

a. Were there any differences among the different grain sources that were stored the same way? What results could be due to different grain sources? Were these differences constant under all storage conditions?

b. Were there differences in grain sources stored different ways? What results could be due to storage? Were these results similar in all grain sources?

c. What are your conclusions of this feed storage experiment?

22. List five feeding management rules you emphasize in your feeding routines of your horses.

23. Define the following terms that relate to breeding programs of horses.

    Estrus

    Ovulation

24. List the following characteristics of the expected 'normal' estrus (heat) cycle of mares.

    Time of year most mares do not cycle

    Time of year most mares begin the estrous period (transition to cycling)

    Months of year most mares are expected to cycle

    Length in days of expected length of one estrous cycle (time from one ovulation to another)

    Length in days of expected length that mares show heat (receptive to stallion) in one estrous cycle

    Time period that mare ovulates within the heat cycle

    Time period to breed in relation to ovulation

25. List two methods to determine pregnancy in mares. How soon following breeding can each method be used with a high level of accuracy?

26. Explain the use of body condition scores and why assessing body condition is important to breeding managers.

27. If you were managing a breeding farm, what information would you require mare owners to provide when delivering a mare to be bred to your stallion?

28. How long is the expected gestation length of mares? What changes in a mare's body and behavior can be observed when mares approach their foaling time?

29. What procedures are recommended for the foal immediately following birth?

30. Diagram an aerial view of a proposed farm that has both training and breeding operations. Identify the type of facilities, giving particular attention to location of activities. Position your facilities to make efficient use of labor and efficient traffic flow of horses, machinery and vehicles.

31. Visit with someone in the business of barn construction to provide recommendations for site preparation including drainage needs. List important points below.

32. Visit with an attorney to obtain some important facts about the legal needs of horse owners (liabilities, contracts). List at least two of the most emphasized points below.

33. Visit with someone who is knowledgeable in tax preparation as related to the horse business. List at least two of the most emphasized points regarding tax preparation for horse owners (records, specific rules and regulations that apply to horse businesses, procedures important for horse owners to follow).

34. Develop a pre-transport checklist that assists in the preparation of the trailer, equipment and tack for hauling a horse. Be specific and complete by identifying routines that emphasize trailer safety, and preparation and packing of equipment and tack.

35. Use three horses that are not familiar with you but are safe and easy to handle. Conduct the activities below and make notes on the horses' behavioral traits.

Activity	***Horse One***	***Horse Two***	***Horse Three***
Place your hand on its side, shoulder, leg, head and throat.			
Attract the horse's attention by: Calling the horse's name Clapping your hands Speak in quiet, soothing voice Rattling a noisy object behind your back and dropping it by your side Moving a bright colored object both slowly and quickly where the horse can see it			
Rate the horses overall behavior as responsive, nervous or shy			

How were the horses similar or different? Which horse had the behavior you liked the most? Why?

36. Use the following body condition scoring system to do the following activity.

Body Condition Scoring System

Score

1 Poor. Animal extremely emaciated. Spinous processes (portion of the vertebra of the backbone which project upward), ribs, tailhead, and bony protrusions of the pelvic girdle (hooks and pins) projecting prominently. Bone structure of withers, shoulders and neck are easily noticeable. No fatty tissues can be felt.

2 Very Thin. Animal emaciated. Slight fat covering over base of spinous processes, transverse processes (portion of vertebrae which project outward) of lumbar (loin area) vertebrae feel rounded. Spinous processes, ribs, shoulders and neck structures are faintly discernable.

3 Thin. Fat built up about halfway on spinous processes, transverse processes cannot be felt. Slight fat cover over ribs. Spinous processes and ribs are easily discernable. Tailhead prominent, but individual vertebrae cannot be visually identified. Hook bones (protrusion of pelvic girdle appearing in upper, forward part of the hip) appear rounded, but are easily discernable. Pin bones (bony projections of pelvic girdle located toward rear, mid-section of the hip) not distinguishable. Withers, shoulders and neck accentuated.

4 Moderately Thin. Negative crease along back (spinous processes of vertebrae protrude slightly above surround tissue). Faint outline of ribs discernable. Tailhead prominence depends on conformation, fat can be felt around it. Hook bones are not discernable. Withers, shoulders and neck are not obviously thin.

5 Moderate. Back level. Ribs cannot be visually distinguished, but can be easily felt. Fat around tailhead beginning to feel spongy. Withers appear rounded over spinous processes. Shoulders and neck blend smoothly into body.

6 Moderate to Fleshy. May have slight crease down back. Fat over ribs feels spongy. Fat round tailhead feels soft. Fat beginning to be deposited along the sides of the withers, behind the shoulders and along sides of neck.

7 Fleshy. May have crease down back. Individual ribs can be felt, but noticeable filling between ribs with fat. Fat around tailhead is soft. Fat deposited along withers, behind shoulders and along neck.

8 Fat. Crease down back. Difficult to feel ribs. Fat around tailhead very soft. Area along withers filled with fat. Area behind shoulder filled in flush. Noticeable thickening of neck. Fat deposited along inner buttocks.

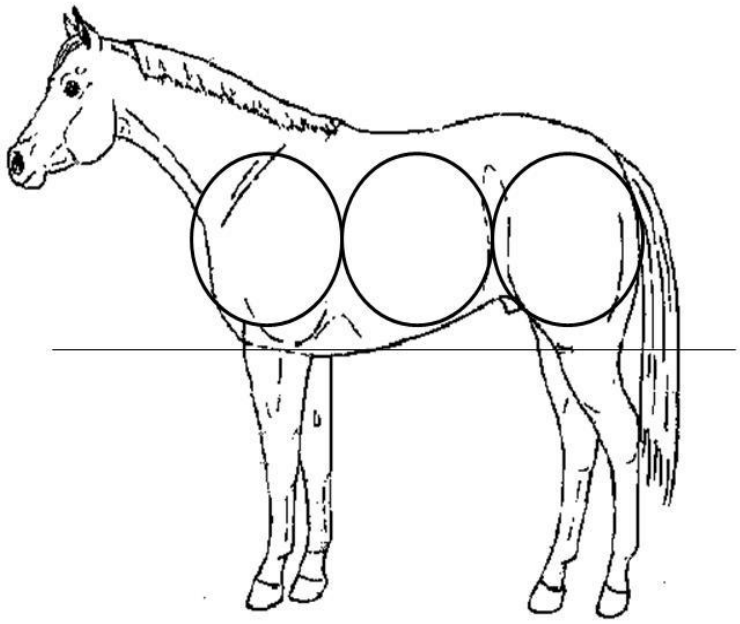
9 Extremely fat. Obvious crease down back. Patchy fat appearing over ribs. Bulging fat around tailhead, along withers, behind shoulders and along neck. Fat along inner buttocks may rub together. Flank filled in flush.

With other members in your group gather 5 horses and evaluate their body condition. Compare your score with the average score of at least five others that independently scored the horses. Estimate each horse's weight (guess), and then use a commercially available heart girth tape to estimate the actual weight, or actually weigh the horses. Complete the following chart.

Horse	*Guess Estimated Weight*	*Estimated Actual Weight*	*Your Estimate of Body Condition Score*	*The Average Score of Body Condition*
1				
2				
3				
4				
5				

How did your estimates of weight and body condition score compare with the estimates of others?

37. Conformational balance refers to the relation of size and proportion of individual body parts with one another. A balanced body allows for more physical advantage for movement in horses. Balance is measured and described several different ways. One measure of balance is how equal the distance from the withers to the bottom of the heartgirth is to the distance from the bottom of the heartgirth to the ground. The more equal the more balanced from top to bottom. Another measure of balance is equating the size of the shoulder, mid-region and the hip. The distance from the point of the shoulder to a line running down the body from the back of the withers (length of shoulder) should be equal to the distance from this line to the beginning of the hip region (length of mid-region). Each of these two distances should also be similar in length to the distance from the start of the hip to the back of the hip (length of hip). With this in mind, complete the following exercises.



Select two horses of different size and complete the following measurements.

Measurement	***Horse One***	***Horse Two***
Distance from top of Withers to Floor of Heartgirth		
Distance from Floor of Heartgirth to Ground		
Length of shoulder		
Length of Mid-Region		
Length of Hip		

Which of the two horses was more balanced top to bottom?

Which of the two horses was more balanced front to rear?

The next exercise will require a camera. Use the horse that has the most balance of body. With the aid of a handler, position the horse's legs squarely under its body as if showing in a halter class. Standing about 15 to 20 feet away from the horse's body, take pictures of the entire horse when standing in three different locations: Directly in line with the middle of the horse's body, directly in line with the head of the horse and directly in line with the rear of the horse's hip. Make sure you stand equal distance from the horse with each of the shots and have the handler position the horse's head and body the same for each shot. Also, include all the horse in each of the photos so that you take one photo straight on, one angling from the head back and one angling from the hip forward. You might want to take additional photographs maintaining your distance from the horse but slightly altering the angles you shoot the photos.

Does balance appear to be different when observing the same horse photographed at different angles? Do different angles of observation cause you to have 'false images' of the horse's balance? If so, how? How does this exercise relate to your procedures to evaluate balance in horses?

38. Purchasers of horses routinely request pre-purchase exams be conducted to determine the health status of a horse they are considering buying. With this in mind, complete the following exercises.

    Visit with a veterinarian who routinely conducts pre-purchase exams and identify the types of tests and information that is included in a pre-purchase exam. List them below.

    As a teaching exercise for other members in your group, divide members into two groups and obtain responses to fill in the following chart. Allow one group to respond to the expected answers for the healthy horse and the other to the sick horse. Check the accuracy of the responses with the assistance of your leader, veterinarian or Cooperative Extension educator.

Characteristics and Conditions	*Healthy Horse*	*Sick Horse*
General Attitude		
Behavior		
Stance and movement		
Weight and Body Condition		
Skin color and texture		
Coat color (shiny, dull, hair loss)		
Mucous membranes (color of gums)		
Ears		
Eyes		
Teeth		
Hooves		
Respiration Rate		
Temperature		
Heart Rate		

39. Attend a commercial horse auction and record the prices of 10 consecutive selling horses in the sale. While watching the horses sell, make notes as to the appearance of the horse, intended purpose, training abilities, pedigree or other attributes that you feel had an influence on price. From your observations, why did some of the horses sell for higher prices than others? Be as specific as possible.

40. There are several concerns that the general public may have about horse production and use. With other members, discuss and record why there may be a concern in the following areas. Also, provide a possible solution for each concern.

Waste Management

Water Quality

Animal Welfare

Land Use and Zoning

41. Develop a plan to estimate the number of horses in your town or county. Outline your plan below. What sources of information would you use? What methods could you employ? Who could you ask to assist?

42. With the assistance of someone in the advertising business, prepare a newspaper or magazine ad to promote a 'make-believe' product for use with horses. Be creative in developing your product. You are encouraged to use a computer, and attach your add to this manual

43. Consider the following situation: A local television station wants to interview you about animal welfare issues that relate to why horses are treated the way they are. Possible questions include why horses are handled certain ways, how they are housed, how they are transported, riding practices, farrier practices, and veterinary procedures. With the help of another member, prepare a video interview in which he or she asks questions concerning why certain practices are conducted. You will play the part of a horse owner responding to the questions. Videotape a short interview that includes at least five questions. Show the tape to your leader. Discuss and report the following.

    What was the hardest part in developing questions?

    What was the hardest part in answering the questions?

Did your answers seem positive and clear, or did you feel defensive and unclear?

Did you find you needed more facts to support your practices?

What might you do different the next time you were interviewed?

44. Prepare a resume that includes your goals, past academic and extra-curricular activities, work experiences and references that can be used for applying for scholarships for college. Review your resume with your high school counselor, parents and others that may be of assistance in evaluating the resume. Identify who reviewed your resume.

45. Via computer, investigate the cost and opportunities of your career interests at a two-year degree program at a junior college, a four-year degree program at a college or university, and a diploma or certification from a trade or vocational school. Discuss with your family.

Part III. Evaluation

1. Based on your years of being a member in 4-H, what would you consider to be some of the most rewarding, memorable experiences with your project activities?

2. Did your experience in 4-H provide you any specific skills that you can list that you think will help you in the future with further education, jobs or life in general?

3. Do you plan to continue your activities around and with horses? If so, what do you guess your involvement with horses will be in 5 years?

Date Member Completed Manual Three _____

Date Member Completed This Manual _____

This certifies that _____ **has successfully completed Manual Four of the Oklahoma 4-H Horse Skills Program.**

_____

(Signature of 4-H Leader who Supervised and Checked Activities)

_____

(Signature of Extension Educator who Reviewed Activities and Completion of This Manual)

Once activities have been reviewed and approved by the above signatures, forward Manual Four to the State Extension Equine Specialist or State Youth Development Specialist with responsibilities in the Horse Project. Manual will be reviewed for content and final approval.

_____

(Signature of State Extension Equine or Youth Development Specialist)

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Sam E. Curl, Director of Oklahoma Cooperative Extension Service, Oklahoma State University, Stillwater, Oklahoma. This publication is printed and issued by Oklahoma State University as authorized by the Dean of the Division of Agricultural Sciences and Natural Resources and has been prepared and distributed at a cost of $0.000 for 000 copies."