

MERIT BADGE SERIES



ANIMAL SCIENCE



BOY SCOUTS OF AMERICA®

STEM-Based

BOY SCOUTS OF AMERICA
MERIT BADGE SERIES

ANIMAL SCIENCE



"Enhancing our youths' competitive edge through merit badges"



BOY SCOUTS OF AMERICA®

Requirements

Always check www.scouting.org for the latest requirements.



1. Name four breeds of livestock in each of the following classifications: horses, dairy cattle, beef cattle, sheep, hogs, poultry, and goats. Tell their principal uses and merits. Tell where the breeds originated.
2. List five diseases that afflict the animals in each of the classifications in requirement 1. Also list five diseases of poultry. Describe the symptoms of each disease and explain how each is contracted and how it could be prevented.
3. Explain the differences in the digestive systems of ruminants, horses, pigs, and poultry. Explain how the differences in structure and function among these types of digestive tracts affect the nutritional management of these species.
4. Select one type of animal—beef cow, dairy cow, horse, sheep, goat, or hog, or a poultry flock—and tell how you would properly manage it. Include in your discussion nutritional (feeding) concerns, housing, disease prevention, waste control/removal, breeding programs, and biosecurity as appropriate.
5. Explain the importance of setting clear goals for any animal breeding program. Tell how purebred lines of animals are produced. Explain the practice of crossbreeding and the value of this practice.

6. Complete ONE of the following options:

Beef Cattle Option

- a. Visit a farm or ranch where beef cattle are produced under any of these systems:
 - (1) Feeding market cattle for harvest
 - (2) Cow/calf operation, producing cattle for sale to commercial feeders
 - (3) Producing purebred cattle for sale as breeding stock to others

Talk with the operator to learn how the cattle were handled, fed, weighed, and shipped. Describe what you saw and explain what you learned. If you cannot visit a cattle ranch or farm, view a video from a breed association, or research the internet (with your parent's permission) for information on beef cattle production. Tell about your findings.

- b. Sketch a plan of a feedlot to include its forage and grain storage facilities, and loading chute for 30 or more fattening steers; or sketch a corral plan with cutting and loading chutes for handling 50 or more beef cows and their calves at one time.
- c. Make a sketch showing the principal wholesale and retail cuts of beef. Tell about the U.S. Department of Agriculture (USDA) dual grading system of beef. Tell the basis of each grade in each system.
- d. Define the following terms: bull, steer, bullock, cow, heifer, freemartin, heiferette, calf.

Dairying Option

- a. Tell how a cow or a goat converts forage and grain into milk. Explain the differences in feeds typically used for dairy cows versus those fed to beef cows.
- b. Make a chart showing the components in cow's milk or goat's milk. Chart the amount of each component.
- c. Explain the requirements for producing grade A milk. Tell how and why milk is pasteurized.



- d. Tell about the kinds of equipment used for milking and the sanitation standards that must be met on dairy farms.
- e. Define the following terms: bull, cow, steer, heifer, springer; buck, doe, kid.
- f. Visit a dairy farm or a milk processing plant. Describe what you saw and explain what you learned. If you cannot visit a dairy farm or processing plant, view a video from a breed or dairy association, or research the internet (with your parent's permission) for information on dairying. Tell about your findings.

Horse Option

- a. Make a sketch of a useful saddle horse barn and exercise yard.
- b. Tell about the history of the horse and the benefits it has brought to people. Using the four breeds of horses you chose in requirement 1, discuss the different special uses of each breed.
- c. Define the following terms: mare, stallion, gelding, foal, colt, filly; mustang, quarter horse, draft horse, pacer, trotter; pinto, calico, palomino, roan, overo, tobiano.
- d. Visit a horse farm. Describe what you saw and explain what you learned. If you cannot visit a horse farm, view a video from a breed association, or research the internet (with your parent's permission) for information on horses. Tell about your findings.
- e. Outline the proper feeding of a horse doing light work. Explain why the amount and kind of feed will change according to the kind of horse and the work it does. Describe what colic is, what can cause it, and its symptoms.



Sheep Option

- a. Make a sketch of a live lamb. Show the location of the various wholesale and retail cuts.
- b. Discuss how wools are sorted and graded.



- c. Do ONE of the following:
- (1) Raise a lamb from weaning to market weight. Keep records of feed intake, weight gains, medication, vaccination, and mortality. Present your records to your counselor for review.
 - (2) Visit a farm or ranch where sheep are raised. Describe what you saw and explain what you learned. If you cannot visit a sheep farm or ranch, view a video from a breed association, or research the internet (with your parent's permission) for information on sheep. Tell about your findings.
- d. Describe some differences between the production of purebred and commercial lambs. Then select two breeds that would be appropriate for the production of crossbred market lambs in your region. Identify which breed the ram should be.
- e. Define the following terms: wether, ewe, ram, lamb.

Hog Option

- a. Make a sketch showing the principal wholesale and retail cuts of pork. Tell about the recommended USDA grades of pork. Tell the basis for each grade.
- b. Outline in writing the proper feeding programs used from the breeding of a gilt or sow through the weaning of the litter. Discuss the feeding programs for the growth and finishing periods.
- c. Do ONE of the following:
 - (1) Raise a feeder pig from weaning to market weight. Keep records of feed intake, weight gains, medication, vaccination, and mortality. Present your records to your counselor for review.
 - (2) Visit a farm where hogs are produced, or visit a packing plant handling hogs. Describe what you saw and explain what you learned. If you cannot visit a hog production unit or packing plant, view a video from a packer or processor, or research the internet (with your parent's permission) for information on hogs. Tell about your findings.
- d. Define the following terms: gilt, sow, barrow, boar.



Avian Option

- a. Make a sketch of a layer house or broiler house showing nests, roosts, feeders, waterers, and means of ventilation. Explain how insulation, ventilation, temperature controls, automatic lights, and other environmental controls are used to protect birds from heat, cold, and bad weather. Explain the importance of light for egg production.
 - b. Explain why overcrowding is dangerous for poultry flocks.
 - c. Tell about the grading of eggs. Describe the classes of chicken meat.
 - d. Do ONE of the following:
 - (1) Manage an egg-producing flock for five months. Keep records of feed purchased, eggs sold, medication, vaccination, and mortality. Present your records to your counselor for review.
 - (2) Raise five chickens from hatching. Keep records of feed intake, weight gains, medication, vaccination, and mortality. Present your records to your counselor for review.
 - (3) Visit a commercial avian production facility. Describe what you saw and explain what you learned. If you cannot visit a commercial facility, view a video from a poultry association, or research the internet (with your parent's permission) for information on poultry production. Tell about your findings.
 - e. Define the following terms: chick, pullet, hen, cockerel, cock, capon.
7. Find out about three career opportunities in animal science. Pick one and find out the education, training, and experience required for this profession. Discuss this with your counselor, and explain why this profession might interest you.



Animal Science Resources

The **county extension office** is home base for your county agent. If possible, visit the county extension office before you start on requirement 6. High school **vocational agriculture teachers** are also good resources.

On the internet (with your parent's permission) visit www.nifa.usda.gov.

Scouting Literature

Mammals pocket guide; *Bird Study*, *Environmental Science*, *Farm Mechanics*, *Horsemanship*, *Mammal Study*, *Plant Science*, *Public Health*, *Soil and Water Conservation*, and *Veterinary Medicine* merit badge pamphlets

With your parent's permission, visit the Boy Scouts of America's official retail website, www.scoutshop.org, for a complete listing of all merit badge pamphlets and other helpful Scouting materials and supplies.

Books

- Belanger, Jerry. *Storey's Guide to Raising Dairy Goats*. Storey Publishing, 2018.
- Damerow, Gail. *Barnyard in Your Backyard: A Beginner's Guide to Raising Chickens, Ducks, Geese, Rabbits, Goats, Sheep, and Cattle*. Storey Publishing, 2002.

Dutson, Judith. *Getting Your First Horse*. Storey Publishing, 2003.

Ekarius, Carol, and Ken Ekarius. *How to Build Animal Housing: 60 Plans for Coops, Hutches, Barns, Sheds, Pens, Nestboxes, Feeders, Stanchions, and Much More*. Storey Publishing, 2004.

Haynes, N. Bruce. *Keeping Livestock Healthy: A Veterinary Guide to Horses, Cattle, Pigs, Goats, and Sheep*. Storey Publishing, 2001.

Klober, Kelly. *Storey's Guide to Raising Pigs*. Storey Publishing, 2018.

Peck-Whiting, Jeanie. *Farm Animals: Your Guide to Raising Livestock*. On the Farm Press, 2003.

Simmons, Paula, and Carol Ekarius. *Storey's Guide to Raising Sheep*. Storey Publishing, 2019.

Thomas, Heather Smith. *Getting Started With Beef and Dairy Cattle*. Storey Publishing, 2005.

Vogel, Colin. *Complete Horse Care Manual*. DK Publishing, 2011.

Organizations and Websites

AgNIC (Agriculture Network Information Collaborative)

Telephone: 301-504-6999
www.agnic.org

AGRICOLA (National Agricultural Library)

Telephone: 301-504-5755
agricola.nal.usda.gov

Agriculture in the Classroom

www.agclassroom.org

American Delaine and Merino Record Association

Telephone: 785-456-8500

www.countrylovin.com/ADMRA/breed.html

American Angus Association

Telephone: 816-383-5100

www.angus.org

American Bantam Association

www.bantamclub.com

American Berkshire Association

Telephone: 765-497-3618

www.americanberkshire.com

American Brahman Breeders Association

Telephone: 713-349-0854

www.brahman.org

American Cheviot Sheep Society

www.cheviots.org

American Chianina Association

Telephone: 816-431-2808

www.chicattle.org

American Corriedale Association

Telephone: 618-676-1046

www.americancorriedale.com

American Dairy Goat Association

Telephone: 828-286-3801

www.adga.org

American Farm Bureau Federation

600 Maryland Ave. SW, Suite 1000W
Washington, DC 20024

Telephone: 202-406-3600

www.fb.org

American Goat Society

Telephone: 830-535-4247

www.americangoatsociety.com

American Guernsey Association

Telephone: 614-864-2409

www.usguernsey.com

American Hampshire Sheep Association

Telephone: 785-456-8500

www.hampshires.org

American Hereford Association

Telephone: 816-842-3757

www.hereford.org

American-International Charolais Association

Telephone: 816-464-5977

www.charolaisusa.com

American Jersey Cattle Association

Telephone: 614-861-3636

www.usjersey.com

American Milking Shorthorn Society

Telephone: 608-365-3332

www.milkingshorthorn.com

American Morgan Horse Association

Telephone: 802-985-4944

www.morganhorse.com

American Paint Horse Association

Telephone: 817-834-2742

www.apha.com

American Poultry Association

www.amerpoultryassn.com

American Quarter Horse Association

Telephone: 806-376-4811

www.aqha.com

American Rambouillet Sheep Breeders Association

Telephone: 785-456-8500

www.countrylovin.com/ARSBA/index.htm

American Saddlebred Horse Association

Telephone: 859-259-2742

www.asha.net

American Sheep Industry Association

Telephone: 303-771-3500

www.sheepusa.org

American Shetland Pony Club

Telephone: 309-263-4044
www.shetlandminiature.com

American Shorthorn Association

Telephone: 402-393-7200
www.shorthorn.org

American Simmental Association

Telephone: 816-599-7777
www.simmental.org

American Southdown Breeders' Association

Telephone: 325-429-6226
www.southdownsheep.org

Appaloosa Horse Club

Telephone: 208-882-5578
www.appaloosa.com

Arabian Horse Association

Telephone: 303-696-4500
www.arabianhorses.org

Breeders World

www.breedersworld.com

Brown Swiss Association

Telephone: 608-365-4474
www.brownswissusa.com

Certified Pedigreed Swine

(Chester White, Hereford, Poland China, and Spotted Swine breed associations)

Telephone: 309-691-0151
www.cpsswine.com

Columbia Sheep Breeders Association of America

Telephone: 507-360-2160
www.columbiasheep.org

Continental Dorset Club

Telephone: 401-647-4676
www.dorsets.com

The Coop

www.the-coop.org

Holstein Association USA Inc.

Toll-free telephone: 800-952-5200
www.holsteinusa.com

National Cattlemen's Beef Association

Telephone: 303-694-0305
www.ncba.org

National 4-H Council

Telephone: 301-961-2800
www.4-h.org

National FFA Organization

Toll-free telephone: 888-332-2668
www.ffa.org

National Pork Producers Council

Telephone: 202-347-3600
www.nppc.org

National Swine Registry

(American Landrace Association, American Yorkshire Club, Hampshire Swine Registry, and United Duroc Swine Registry)
Telephone: 765-463-3594
www.nationalswine.com

NetVet – Veterinary Resources

netvet.wustl.edu/vet.htm

North American Limousin Foundation

Telephone: 303-220-1693
www.nalf.org

Pony of the Americas Club Inc.

Telephone: 317-788-0107
www.poac.org

Tennessee Walking Horse Breeders' and Exhibitors' Association

Telephone: 931-359-1574
www.twhbea.com

U.S. Ayrshire Breeders Association

Telephone: 614-335-0020
www.usayrshire.com

U.S. Department of Agriculture (USDA)

1400 Independence Ave. SW
Washington, DC 20250
Telephone: 202-720-2791
www.usda.gov

United Suffolk Sheep Association

Telephone: 641-684-5291
www.suffolks.org