

# 4-H Beef Cattle Project

## Learning Outcomes

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The objective of this publication is to provide an overview of the learning outcomes for intermediate-level youth who participate in the 4-H Beef Project. As the name implies, youth should complete these learning objectives after completing the beginner-level objectives, but before completing the advanced-level objectives. This publication serves as a reference for Extension 4-H agents, volunteers, parents and youth at this level, and provides guidelines for the desired knowledge, skills and activities that should be obtained or completed by youth after completion of the beginner-level learning outcomes. The objectives in this level should be completed before moving on to the advanced level of experience. Achieving these learning outcomes will expand upon the foundation of knowledge that was established by completing the beginner-level outcomes and will prepare youth for completing the advanced-level outcomes.

### Fundamental Knowledge and Skills

Listed below are specific fundamental knowledge and skills that are relevant and important to achieving the intermediate-level learning objectives of the 4-H Beef Project.

- **Industry**
  - Compare and contrast the following sectors of the U.S. beef industry: cow/calf, stocker/backgrounding, feedlot/finishing, harvest/packing and retail.
- **Genetics and evaluation**
  - Distinguish between the two subspecies of beef cattle in the U.S.
  - Identify the following regions and parts of the body: cannon bone, cod (steers), crest, dewclaw, dewlap, flank, forearm, heart girth, hock, hook, navel (cows and heifers), sheath (bulls and steers), pastern, pin, point of shoulder, stifle and twist.
  - Identify a bull, bullock and steer based upon standard characteristics.
  - Define the following terms: accuracy (as it applies to EPDs), allele, chromosome, economically relevant indexes (ERIs), and genetic defects.



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- Describe the role of each of the following EPDs in genetic selection: average daily gain (ADG), calving ease direct (CED or CE), calving ease maternal (CEM or MCE), docility (Doc), gestation length (GEST), heifer pregnancy (HP or HPG), maintenance energy (ME), maternal weaning weight (MWW), shear force (SF), stayability (ST or STY), and udder suspension (UDDR).
- Describe the meaning of each of the following economically relevant indexes: all-purpose index (API), beef value (\$B), cow energy value (\$EN), feedlot value (\$F), GridMaster, grid value (\$G), HerdBuilder, quality grade (\$QG), terminal index (TI), terminal sire index (TSI), weaned calf value (\$W), and yield grade (\$YG).
- Distinguish between inbreeding and outcrossing.
- Describe the following genetic defects and identify the breed to which they are most commonly associated: arthrogryposis multiplex, double-muscling, dwarfism, developmental duplication, neuropathic hydrocephalus, pulmonary hypoplasia with anasarca, and tibial hemimelia.
- **Nutrition**
  - Distinguish between and describe the function of the following portions of the ruminant digestive tract: abomasum, esophagus, large intestine, omasum, reticulum, rumen and small intestine.
  - Illustrate the flow of ingesta through the major portions of the digestive tract.
  - Identify and distinguish between the following forages and feedstuffs: alfalfa, blood meal, corncob meal, corn gluten feed, cottonseed hulls, cottonseed meal, distiller's grains, dried molasses, ground ear corn, orchard grass, peanut hulls, roasted soybeans, soybean hulls, tall fescue, timothy, wheat middlings, whole barley, whole canola (rapeseed), whole oats, whole sorghum (milo), and whole wheat.
  - Distinguish between the following nutrition-related disorders: acidosis, bloat, fescue toxicosis, hypocalcaemia or milk fever, and hypomagnesemia.
  - Explain the following processes: creep feeding, preconditioning, suckling and weaning.
  - Describe the following nutrients or nutrient analyses: carbohydrates, fat, fiber, non-protein nitrogen, non-starch polysaccharides, relative feed value, relative forage quality, starch, total digestible nutrients, and water-soluble or non-fibrous carbohydrates.
  - Define the following types of medicated feeds: type A medicated article, type B medicated feed and type C medicated feed.
  - Differentiate between low- and high-quality hay by visual appraisal.
  - Define compensatory gain.
- **Reproduction**
  - Define the following terms: anestrus, dystocia, estrus, estrous cycle, gestation, parturition and postpartum.
  - Distinguish between the following components of a reproductive tract and to which sex they correspond: ovary, penis, sheath, testes, uterus and vulva.
  - Describe the concept of a freemartin and explain why it occurs.

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- Differentiate between the following word usage: anestrus vs. anestrous and estrus vs. estrous.
- Outline the basic processes and benefits of estrus synchronization, artificial insemination, embryo transfer and in vitro fertilization.
- **Health and welfare**
  - Demonstrate the proper location to administer intramuscular and subcutaneous injections.
  - Calculate dosage rate based upon weight.
  - Define the following terms: antimicrobial, caesarean section, coagulation, coccidiosis, cold stress, dehydration, de-wormer, disease control, disease prevention, electrolyte, heat stress, necropsy, persistently-infected, prevention, temperature-humidity index and treatment.
  - Describe and the causes, symptoms, and possible outcomes of the following diseases and conditions: blackleg, bovine viral diarrhea, brucellosis, parainfluenza, shipping fever, tuberculosis and white muscle disease.
  - Demonstrate the proper method of administering a drench.
- **Carcass and beef products**
  - Identify the following retail beef cuts and to which wholesale cut they correspond: blade roast, bottom round roast, bottom round steak, bottom sirloin roast, bottom sirloin steak, chuck roast, eye of round roast, eye-of-round steak, porterhouse steak, ribeye roast, ribeye steak, shank steak, shoulder roast, shoulder steak, strip steak, T-bone steak, tenderloin filet, tenderloin roast, top round roast, top round steak, top sirloin roast, top sirloin steak, tri-tip roast and tri-tip steak.
  - Define the following measurements and calculations: live weight, hot carcass weight, back fat thickness, ribeye area, dressing percent, yield grade and quality grade.
  - Identify and distinguish between the following USDA grades of slaughter cattle: prime, choice, select, standard, commercial, utility, cutter and canner.
  - Demonstrate the ability to differentiate between the following categories of carcass maturity: A, B, C, D and E.
  - Differentiate between the following USDA carcass yield grades: 1, 2, 3, 4 and 5.
- **Performance measurements**
  - Distinguish between direct measurements and ratios and calculate within-herd ratios for any measurable trait.
  - Calculate the following: pregnancy percentage, postpartum interval, calving percentage, calving interval, death-loss percentage, weaning percentage, adjusted 205-day weaning weight, adjusted 365-day yearling weight and frame score.
  - Define and apply the following scoring systems: body condition, disposition, udder suspension and teat size.

- **Economics and marketing**

- Outline the beef cattle cycle and describe its effect on profitability.
- Describe seasonality as it applies to beef cattle prices.
- Distinguish between the following marketing classes of cull cows: breaker, boner, lean and light.
- Differentiate between the following USDA frame size grades of feeder cattle: large (L), medium (M), and small (S).
- Differentiate between the following USDA thickness grades of feeder cattle: 1, 2, 3 and 4.
- Create a beef cattle enterprise (cow/calf, stocker or feedlot) budget.

## **Educational Contests, Programs and Certifications**

Listed below are specific activities that are relevant and important to achieving the intermediate-level learning objectives of the 4-H Beef Project.

- Participate in one or more Skillathon contests.
- Compete in a livestock judging contest.
- Receive Beef Quality Assurance certification.

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