

# Dairy

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## State of the Industry

- Analyze the effect of the beef industry on the dairy industry.
- Assess the impact of water availability on the dairy industry.
- Evaluate the advantages and disadvantages of on-farm processing.
- Identify a controversial dairy topic and explain its purpose to a nonagricultural audience.

## Breeds

- Create an educational piece for younger 4-H'ers that describes the advantages and differences of different breeds of dairy cattle.
- Collect a DNA sample for genomic testing to determine breed percentage and parentage.

## Health and Disease

- Create a model of either the digestive or reproductive tracts or the cross-section of the claw in dairy cattle to create an educational display.
- Given a scenario, identify problems within the hoof anatomy that would cause lameness.
- Differentiate between environmental and contagious pathogens that cause mastitis.
- Compare and contrast causes, outcomes and costs of subclinical and clinical diseases.
- Create management plans including biosecurity measures and disease control for dairy facilities.
- Demonstrate proper procedures for intramammary antibiotic therapy, aseptic milk sample collection, dry cow therapy, wrapping a hoof, blocking a hoof.
- Demonstrate your ability to administer subcutaneous and intramuscular injections.
- Create a comprehensive vaccination protocol.
- Demonstrate your ability to handle and store antibiotics, needles, syringes and vaccines.
- Define the following terms: adjuvant, anthelmintic, anticoagulant, antigen, antimicrobial resistance, fecal egg count, immunology, immunoglobulin, innate immune system, over-the-counter, prescription, prophylactic and veterinary feed directive.
- Describe and distinguish between the following diseases and conditions: anaplasmosis, bovine leukosis virus, bovine respiratory syncytial virus, infectious bovine rhinotracheitis, Johne's disease, leptospirosis, pasteurella and vibriosis.



## Equipment and Records

- Demonstrate your ability to apply an ear tag, ear tattoo, freeze brand and EID tag.
- Design the ideal layout for a lactating, dry, heifer, or calf facility. Include flooring; stall layout and size; walls; roofing; ventilation; storage for bedding, hay and equipment; human facilities; and other structures associated with dairy facilities.
- Create a budget for facility construction and maintenance based on material estimates.
- Review and apply pasture or cropland management considerations to farm management plans and recommendations for maintaining or establishing new pasture or cropland.
- Understand paperwork, permits and other regulations impacting dairy facility construction.
- Analyze the impact of dairy farms on environmental quality and ways to improve management practices.
- Evaluate reproductive, health and removal rates from a dairy farm's records. Identify areas of excellence and make recommendations for improvement.

## Nutrition and Feeding

- Demonstrate proper colostrum testing procedures and determine passive transfer.
- Describe cause of and treatment for the following nutrition-related metabolic disorders: acidosis, bloat, hypomagnesemia and tall fescue toxicosis.
- Determine the amount of feed and water that dairy cattle should consume.
- Calculate feed efficiency.
- Create a ration to meet the needs of a lactating dairy cow.
- Identify toxic plants to dairy cows, describe their effects if cows are exposed, and provide physical descriptions of each.
- Distinguish common weeds, grasses and legumes based on their growth periods, physical appearance, management strategies and nutritive value through growth stages.
- Calculate the amount of milk or milk replacer needed to ensure a calf meets a given weaning weight or average daily gain.

## Genetics and Reproduction

- Demonstrate proper techniques for castration, dehorning, removing supernumerary teats and artificial insemination.
- Given a scenario, create an ideal mating list for a dairy herd.
- Explain when and how sex differentiation occurs in fetal development.
- Distinguish between structure and function of the following components of a reproductive tract and to which sex they correspond: corpus albicans, corpus hemorrhagicum, corpus luteum, epididymis, follicle, oocyte, oviduct, cervix, vulva, retractor penis muscle, scrotum, spermatic cord, spermatocyte, uterine body, uterine horn and vagina.
- Create a timed artificial insemination protocol.

## Dairy Products and Processing

- Design an optimized layout for a dairy processing facility. Include structural materials and design; facility room layout (including unload of raw fluid and dry ingredients, raw and finished goods storage, production, mechanical, quality assurance, bath/locker rooms,

## Dairy Advanced Outcomes

laboratories, offices, etc.); and equipment layout (with production flow diagrams) in accordance with the latest version of the Grade A Pasteurized Milk Ordinance and Code of Federal Regulations Title 21 – Part 117.

- Create a budget for facility construction and maintenance based on material estimates.
- Understand paperwork, permits and other regulations impacting dairy processing facility construction.
- Analyze the impact of a dairy processing facility on environmental quality and ways to improve management practices.
- Develop a novel dairy product and/or ingredient that includes a formulation with a batch sheet, packaging and label (refer to Code of Federal Regulations Title 21 – Part 117), and a marketing plan.
- Food Safety Plan including the hazard analysis, critical control points, along with the preventative controls, Allergen Plan, Environmental Monitoring Program and Product Monitoring Program.

## Economics and Marketing

- Optimize a dairy farm operation and create a farm partial budget.
- Optimize a dairy processing facility and create an operational budget.

## Extra Learning Opportunities

- Dairy Skillathon Contest.
- Dairy Cattle Judging Contest.
- Dairy Cattle State Show and Showmanship Contest.
- Receive Beef Quality Assurance certification.
- 4-H Portfolio.
- 4-H Round-Up.
- Dairy Quiz Bowl.
- Volunteer with your local Extension office.
- Assist Younger Youth.
  - Encourage other youth to participate in the 4-H dairy project.
  - Help other youth with showmanship or with learning skillathon topics.

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