Overview of Lessons

Animal Agriculture

1. Food, Fiber, and More from Animals
   Learn about the varied uses of animal byproducts or coproducts, focusing on agricultural animals produced in Maryland.
   - Identify common items made from byproducts.
   - Make homemade glue from milk.

2. Wild and Wooly
   Learn about sheep and goats and the various products derived from them.
   - Compare and contrast photos of sheep and goats.
   - Perform a forensic activity by comparing wool and other fibers under a microscope.

3. Moo Who?
   Differentiate between beef and dairy cattle (Bos taurus) and observe how each species evolved over time.
   - Identify important physical characteristics of beef and dairy cattle.
   - Analyze photographs of cattle for evidence of beef or dairy characteristics.

4. Animal Digestion
   Compare and contrast the digestive systems of ruminant (4 compartment stomach) and monogastric (single stomach) animals, observing how groups share differences and similarities which can be used to infer the degree of relatedness among organisms.
   - Identify digestive organs and different types of digestive systems by coloring diagrams.
   - Compare and contrast human and animal digestive systems.

5. Undressing the Mystery of Meats
   Learn about meat consumed by humans and the role meat plays as an agricultural commodity in human diets as well as Maryland’s economy.
   - Identify the sources of meats and non-meat proteins people eat.
   - Analyze students’ diets for meat consumption.
   - Make a poster sharing knowledge of meats.
6. Milk in Motion: A Dynamic Dairy Experiment
Learn about the dairy industry and dairy products, as well as learn about dynamic properties found in milk.
• Use food coloring and soap to explore the properties of different types of milk.
• Interpret labels of dairy products for nutrition information.
• Make butter and ice cream.

7. Poultry: Feed Basics for a Growing Bird
Learn about the effects of nutrition on broiler chicken growth and processing and simulate the mixing of poultry feed using animal feed ratios.
• Arrange the stages of chicken growth in order.
• Simulate the mixing of feeding rations and calculate the percentage of feed ingredients.

8. Horses and Evolution
Understand how horses evolved over time and compare and contrast how different types of horses are used today as well as learn horse related terminology
• Analyze a horse evolution timeline.
• Understand selective breeding by comparing and contrasting horse breeds by building models.

PLANT AGRICULTURE

9. It’s Not Just Dirt
Learn about soil a natural resource, what its components are, how it is used and if it is renewable.
• Compare and contrast samples of different soils.
• Allow a mixture of soil and water to settle and diagram the composition of the soil.

10. Send in the Sun: A Look at Photosynthesis
Observe the results of photosynthesis and lack of photosynthesis over an extended period of time.
• Trace the stages of photosynthesis and identify the materials needed for plants to produce food.
• Conduct an experiment to determine how lack of light affects photosynthesis.

11. Grains: The Whole Story
Understand the important food and non-food uses of the major grains grown in Maryland.
• Learn the importance of grains and how to identify different types of grains.
• Analyze food packages to determine the nutritional value of grain products.

12. Soy: The Magic Bean
Explain the role of soybeans and other legumes in making nitrogen available in a form that can be used by plants, animals, and humans and understand why plants such as grasses benefit from legumes for growth.
• Compare legumes and grains; trace the stages of the nitrogen cycle.
• Predict whether or not common products used by humans contain soybeans.
Simulate a farmer’s market to learn about the benefits of locally grown food.
- Simulate a farmers’ market by assuming the role of a vendor or consumer.
- Interpret the MyPlate dietary guidelines by creating a balanced meal.

14. Amaizing Corn
Develop an understanding of the uses of corn in feeding humans and livestock, fueling our cars, and many other applications.
- Identify the 3 types of corn grown in the world.
- Learn the major uses of corn and its byproducts.
- Make a bio-plastic from corn by-products.

15. Food for Thought: Agriculture in the Chesapeake Bay Watershed
Develop an understanding of size and importance of the Chesapeake Bay watershed and recognize Maryland Agriculture as integral to human life in the watershed.
- Color a map of the watershed and identify the states that contribute water to the Chesapeake Bay.
- Prepare a presentation about crops grown in Maryland.

Develop an understanding of ways in which the activities of humans can cause nonpoint pollution within a watershed.
- Build a watershed model, develop and pollute it, and observe the effects of rainfall.
- Identify ways in which pollution can be reduced by each of us.

17. Conservation Choices: How Farmers and Developers Protect the Bay
Understand how Maryland farmers and developers can use conservation techniques to reduce environmental damage.
- Match photographs and descriptions of soil conservation techniques.
- Design a conservation plan for an area that has erosion and water quality problems.

18. Who Lives Here? Species of the Bay Region and Watershed
Identify numerous species, including birds, and wildlife living in the bay and its tributaries and learn how these species positively or negatively affect our bay.
- Match photographs with facts about wildlife species living in the Bay watershed.
- Identify ways that species have a positive or negative effects on agriculture.
- Create a Bay food web diagram.
19. Persistent Pests
Simulate the effects of pesticides on an insect population and observe how the population changes over time.
• Use beans to model changes in an insect population exposed to pesticides.
• Explored alternatives to repeated pesticide usage.

20. Something Fishy: Aquaculture in Maryland
Understand that harvest rates of aquatic organisms by humans that are higher than reproductive rates can lead to a population’s decline and realize the importance of aquaculture’s role in providing a sustainable seafood supply for an increasing human population in the Chesapeake Bay watershed.
• Simulate the effects of seafood harvesting on populations of aquatic organisms.
• Identify pros and cons of aquaculture.

21. What’s in Your Genes?
Learn how to predict plant and animal offspring traits or characteristics using genetics.
• Use a checklist to identify personal dominant and recessive genetic traits.
• Use Punnett squares to predict the results of genetic crosses.

22. Food Safety is for Everyone
Understand causes of foodborne illnesses and how to prevent them as well as simulate the growth of bacterial colonies and learn proper hand washing techniques.
• Use candy or beads to model bacteria growth.
• Compare the effectiveness of different hand washing techniques using fluorescent gel or powder.

23. Down and Dirty with Biosecurity
Research biosecurity strategies and develop a plan to promote biosecurity at a hypothetical livestock production facility.
• Assess animal health by looking for evidence of health and disease in photographs.
• Create a biosecurity plan for a livestock facility.

24. Feeding Our Future
Explore DNA, the molecule that is responsible for the inheritance of traits, and understand that selective breeding and genetic engineering are used to develop desired traits.
• Understand that DNA is found in all of the food that we eat.
• Extract DNA from corn and observe what large quantities of DNA look like to the naked eye.
• Learn about genetically modified organisms (GMOs) in agriculture.
April Hall Barczewski  
4-H Educator  
*University of Maryland Extension Cecil County*  
200 Chesapeake Boulevard, Suite 1500  
Elkton, MD 21921  
adhall@umd.edu  
Phone: 410-996-5280

Sheryl Bennett  
4-H Educator  
*University of Maryland Extension Howard County*  
3300 North Ridge Road, Suite 240  
Ellicott City, MD 21043  
sherylb@umd.edu  
Phone: 410-313-1912

Sara Meagher BhaduriHauck  
Faculty Extension Assistant  
*University of Maryland Extension Harford County*  
P.O. Box 663  
Forest Hill, MD 21050  
sbh@umd.edu  
Phone: 410-638-3255

David Gordon  
Faculty Extension Assistant, 4-H and Agriculture  
*University of Maryland Extension Montgomery County*  
18410 Muncaster Road  
Derwood, MD 20855  
dgordon3@umd.edu  
Phone: 301-590-2813

Thomas Hutson  
4-H Educator  
*University of Maryland Extension Talbot County*  
28577 Marys Court, Suite 1  
Easton, MD 21601  
thutson@umd.edu  
Phone: 410-822-1244