

<b>Course</b>	Agricultural Science I
<b>Unit</b>	Introduction to Poultry Production
<b>Lesson</b>	Processing and Marketing
<b>Estimated Time</b>	50 minutes
<b>Student Outcome</b>	

Identify procedures involved in processing poultry products.

### Learning Objectives

1. Explain the steps in processing poultry for meat.
2. Describe how the poultry industry has added value to its products.
3. Identify the common sanitation and inspection concerns.
4. Identify the steps in egg processing.
5. Explain how eggs are marketed.

### Grade Level Expectations

### Resources, Supplies & Equipment, and Supplemental Information

#### Resources

1. *Introduction to Poultry Production (Student Reference)*. University of Missouri-Columbia: Instructional Materials Laboratory, 1999.
2. *Introduction to Poultry Production Curriculum Enhancement*. University of Missouri-Columbia: Instructional Materials Laboratory, 2003.

#### Supplemental Information

1. Internet Sites
  - ❑ "Animal Science Publications." MU Extension. University of Missouri-Columbia. Accessed October 2, 2007, from <http://extension.missouri.edu/explore/agguides/ansci/>.
  - ❑ "Egg Grading Manual." *Agricultural Handbook Number 75*. Agricultural Marketing Service. United States Department of Agriculture. Accessed October 2, 2007, from <http://www.ams.usda.gov/Poultry/pdfs/EggGrading%20manual.pdf>.
  - ❑ "Poultry Products Safety and Quality Peak of Excellence Program." College of Agriculture: Department of Poultry Science. Auburn University. Accessed October 2, 2007, from <http://www.ag.auburn.edu/poul/peakwelcome.html>.
  - ❑ "Poultry Programs." Agricultural Marketing Service. United States Department of Agriculture. Accessed October 2, 2007, from <http://www.ams.usda.gov/poultry>.
  - ❑ "USDA Poultry Grading Manual." *Agriculture Handbook Number 31*. Agricultural Marketing Service. United States Department of Agriculture. Accessed October 2, 2007, from <http://www.ams.usda.gov/poultry/resources/PYGradingManual.pdf>.
2. Print
  - ❑ Ensminger, M.E., *Poultry Science*. 3rd ed. Danville, IL: Interstate Publishers, Inc., 1992. Gillespie, James R., *Modern Livestock and Poultry Production*, 5th ed. Albany: Delmar Publishers. 1997.

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- ❑ *Introduction to Animal Reproduction (Student Reference)*. University of Missouri-Columbia: Instructional Materials Laboratory, 1996.
  - ❑ Moreng, Robert E. and John S. Avens. *Poultry Science and Production*. Prospect Heights, IL: Waverly Press, Inc. 1991.
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### Interest Approach

Have students call or visit a grocery store to talk with the manager or employees in the meat department. Student should ask the following:

- Where is the meat from? Is the meat a local product? Is the meat from in the state or from out-of-state?
- In what form does the meat come into the store?
- How it is handled and displayed for sale after arrival?

### Communicate the Learning Objectives

1. Explain the steps in processing poultry for meat.
2. Describe how the poultry industry has added value to its products.
3. Identify the common sanitation and inspection concerns.
4. Identify the steps in egg processing.
5. Explain how eggs are marketed.

Instructor Directions	Content Outline
<b>Objective 1</b>  <i>Considering the interest approach, ask students what is important to the consumer. What do students think is done in the processing plant to prepare a bird?</i>	<b>Explain the steps in processing poultry for meat.</b>  Remove food (but not water) from the poultry house in preparation for processing <ol style="list-style-type: none"><li>1. 8 to 10 hours before taking birds to processing plant.</li><li>2. Minimizes amount of food in the intestine to avoid contamination during evisceration.</li></ol> Major steps in processing <ol style="list-style-type: none"><li>1. Stunning by electrical shock to render bird unconscious.</li><li>2. Bleeding to allow blood to drain completely to avoid discoloration.</li><li>3. Scalding submerges carcass into hot water for 1.5 to 2 minutes. Relaxes muscles that hold feathers making it easier to remove feathers.</li><li>4. Picking removes feathers from the bird by machine that has rotating rubber fingers.<ol style="list-style-type: none"><li>a. Remaining feathers burned off.</li><li>b. Rinse with water to remove foreign matter, blood, and feathers from the carcass.</li></ol></li><li>5. Evisceration removes organs of abdominal cavity, lungs, and heart. Feet, head, and oil gland also removed at this time.</li><li>6. Rapidly chilled in ice water, graded, packaged, and labeled.</li></ol>

Instructor Directions	Content Outline
	<p>Mark as ice-packed, dry chill-packed, or vacuum-packed frozen</p> <ol style="list-style-type: none"> <li>1. Ice packing places processed poultry into waxed boxes filled with crushed ice or CO<sub>2</sub> (Dry Ice).</li> <li>2. Dry, chill-packed poultry is placed on small trays with absorbent paper, wrapped in plastic wrap, then passed through a blast freezer to chill meat.</li> <li>3. Vacuum-packed frozen poultry wrapped in plastic bags, and then frozen in blast freezer.</li> </ol>
<p><b>Objective 2</b></p> <p><i>Ask students what poultry products they eat or have seen available at their local grocery stores and fast-food restaurants. Discuss how these processed poultry items have added to consumer demand for poultry products.</i></p>	<p><b>Describe how the poultry industry has added value to its products.</b></p> <ol style="list-style-type: none"> <li>1. USDA grading system and further processing of product has added value to poultry.</li> <li>2. Grading system enables sale of top grade meat at a higher price than non-graded meat.</li> <li>3. Further processing of meat and eggs offers convenience to the consumer and increases sales.</li> <li>4. Industry sells traditional whole, oven-ready carcasses and now offers a variety of poultry items that are easy to prepare.</li> <li>5. Small percentage of broilers sold as whole carcasses. Most are sold as cut-up parts, cooked, or further processed.</li> </ol>
<p><b>Objective 3</b></p> <p><i>Ask students what they think an inspector should look for in a processing plant. Ask students if they see the value of doing scientific testing for bacteria in processing plants. Why or why not?</i></p>	<p><b>Identify the common sanitation and inspection concerns.</b></p> <ol style="list-style-type: none"> <li>1. The poultry industry is responsible for maintaining strict sanitation regulations as set by the government.</li> <li>2. Only producers who subscribe to the USDA grading system and pass strict regulations for facility and carcass sanitation and quality standards may use the USDA symbol.</li> <li>3. USDA inspectors make inspections of live birds to look for symptoms of disease or problems that would make product unsuitable for human consumption.</li> <li>4. USDA inspects bird carcasses to look for unusual body conditions that make the carcass unfit to be consumed by humans.</li> <li>5. Carcasses graded by USDA-trained graders.</li> </ol>

Instructor Directions	Content Outline
	<ol style="list-style-type: none"> <li>6. USDA inspectors monitor facilities, employees, plant grounds, and equipment to meet strict sanitation standards.</li> <li>7. In 1996, HACCP (Hazard Analysis and Critical Control Points) legislation implemented scientific testing for bacteria.               <ol style="list-style-type: none"> <li>a. Every plant must adopt a HACCP plan to deal with specific and potential hazards of the product; kept in check by USDA inspectors from the Food Safety and Inspection Service.</li> <li>b. Every slaughter facility must have regular carcass testing for <i>E. coli</i> bacteria.</li> <li>c. All plants that produce ground-up products must have routine Salmonella testing.</li> <li>d. Every plant must write out and perform a sanitation Standard Operation Procedure (SOP) for meeting sanitation responsibilities.</li> </ol> </li> </ol>
<p><b>Objective 4</b></p> <p><i>Ask students what processing procedures they think are involved in egg production. As a consumer how would they choose eggs in the grocery store.</i></p>	<p><b>Identify the steps in egg processing.</b></p> <ol style="list-style-type: none"> <li>1. Naturally prepackaged food.</li> <li>2. Eggs washed to remove any manure or foreign matter stuck to the shell.</li> <li>3. Wash eggs in water warmer than the eggs. Avoids shrinking slightly and creating a vacuum that sucks in impurities and bacteria.</li> <li>4. Air dry eggs after washing.</li> <li>5. Oil eggs with paraffin-based mineral oil to replace washed away protective layer.</li> <li>6. Candle eggs looking for unsuitable eggs.               <ol style="list-style-type: none"> <li>a. Air cell size</li> <li>b. Yolk shadow position</li> <li>c. Presence of blood or meat spots</li> <li>d. Presence or lack of germ development</li> </ol> </li> <li>7. Cull unsuitable eggs.</li> <li>8. Refrigerate eggs.</li> <li>9. Weighed, graded, and packaged for retail.</li> </ol>

<p><b>Objective 5</b></p> <p><i>Discuss ways that students have been aware of marketing of eggs on television or in print ads. What have they heard about the nutritional value of eggs? What was the source of this information?</i></p>	<p><b>Explain how eggs are marketed.</b></p> <ol style="list-style-type: none"> <li>1. Value added to product by wise marketing and use of further processing.</li> <li>2. Fast food restaurants use egg products for breakfast foods.</li> <li>3. American Egg Board advertising campaigns promote versatility and nutritional benefits.</li> <li>4. Quality ensured by egg grading. USDA standards can sell an egg with high grade symbol at a higher price.</li> </ol>
<p><b>Application</b></p>	<p>Other activities</p> <ol style="list-style-type: none"> <li>1. Examine an egg under a bright light, as in candling, to observe any shapes or forms in the egg.</li> <li>2. Cut up a chicken and identify the parts.</li> <li>3. Compare processed cold cuts such as smoked turkey slices, turkey ham, and turkey bologna.</li> </ol>
<p><b>Closure/Summary</b></p>	<p>Poultry and egg production processing is highly regulated to provide a quality product to the consumer. Standards established by the USDA and HAACP guidelines regulate the industry to maintain sanitary and safe conditions for the consumer and the worker. Added value with additional processing has increased demand for poultry products. Marketing campaigns have helped to maintain and improve the image of the poultry industry.</p>
<p><b>Evaluation: Quiz</b></p>	<p>Answers</p> <ol style="list-style-type: none"> <li>1. Reduces food in the intestine that can cause contamination during evisceration.</li> <li>2. Stunned, bled, scalded, picked, eviscerated, chilled, graded, packaged, and labeled.</li> <li>3. Answers will vary but should include: USDA grading system allowing top-grade meat to be sold at a higher price; convenience products add increased sales to the poultry industry. Examples of further processed products are breast fillets, nuggets, hot dogs, cold cuts, ground meat, sausages, and frozen dinners.</li> <li>4. Routine scientific testing for hazardous bacteria</li> <li>5. To replace the washed away protective layer</li> <li>6. Examine the egg in front of light to observe internal characteristics to determine if egg is edible or hatchable.</li> </ol>

	7. Eggs with USDA grade symbol can be sold at a higher price.
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