

Course	Agricultural Science I
Unit	Introduction to Poultry Production
Lesson	Production
Estimated Time	50 minutes

Student Outcome

Describe poultry production and management practices.

Learning Objectives

1. Identify the different types of commercial poultry production systems.
2. Explain the facilities and equipment required for poultry production systems.
3. Explain the nutritional requirements of poultry.
4. Explain how poultry production wastes and byproducts are utilized and managed.

Grade Level Expectations

SC/LO/1/B/09-11/b	SC/ST/1/B/09-11/a	SC/ST/1/C/09-11/a
SC/ST/3/B/09-11/a	SC/ST/3/B/09-11/b	SC/ST/3/B/09-11/c
SC/ST/3/D/09-11/a		

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 September 12, 2007, from <http://extension.missouri.edu/explore/agguides/ansci/>.
 - ☐ Commercial Poultry Production Resources. Cooperative Extension. The Pennsylvania State University. Accessed September 12, 2007, from <http://poultryextension.psu.edu/Comproduction.html>.
 - ☐ Poultry: Small Flock Management. Cooperative Extension Service. Mississippi State University. Accessed September 12, 2007, from <http://msucare.com/poultry/management/index.html>.
 - ☐ "Poultry Waste Management Handbook." Texas Extension Service. The Texas A & M University System. Accessed September 12, 2007, from <http://gallus.tamu.edu/Extension%20publications/Waste/tableofcontents.htm>.
2. Print
 - ☐ Ensminger, M.E., *Poultry Science*. 3rd ed. Danville, IL: Interstate Publishers, Inc., 1992.

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- ❑ Field, Thomas G. and Robert E. Taylor. *Scientific Farm Animal Production*. 6th ed. Upper Saddle River, NJ: Prentice-Hall, Inc. 1998.
 - ❑ Gillespie, James R., *Animal Science*. Albany: Delmar Publishers, 1998.
 - ❑ Gillespie, James R., *Modern Livestock and Poultry Production*. 5th ed. Albany: Delmar Publishers, 1997.
 - ❑ Moreng, Robert E. and John S. Avens. *Poultry Science and Production*. Prospect Heights, IL: Waveland Press, 1991.
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Interest Approach

Ask students to brainstorm ideas about what factors they think are important in poultry production systems. They should include facility layout, equipment, nutritional needs, and waste management. Record the ideas. Students that have small poultry operations at home can suggest things that are used in small operations. Ask how this compares to large commercial operations.

Communicate the Learning Objectives

1. Identify the different types of commercial poultry production systems.
2. Explain the facilities and equipment required for poultry production systems.
3. Explain the nutritional requirements of poultry.
4. Explain how poultry production wastes and byproducts are utilized and managed.

Instructor Directions	Content Outline
Objective 1 <i>Discuss the four major commercial enterprises: broiler production, turkey production, egg production, and pullet production for replacement purposes. Generally, they all have integrated or contract operations. Discuss vertical integration systems and how each production process fits into this system.</i>	Identify the different types of commercial poultry production systems. <ol style="list-style-type: none">1. Vertical integration - Two or more stages of the production, processing, and distribution are controlled by a single firm.2. Broiler production<ol style="list-style-type: none">a. Well-suited to assembly line techniquesb. Integrated system is typical with 99 percent of broilers produced under contract<ol style="list-style-type: none">1. Integrated contractor - Provides chicks, feed, processing, vaccinations, supervision, and transportation2. Producer/grower - Provides housing, grow-out equipment (feeders, waterers, and brooder houses), utilities, labor, and managementc. Highly automated for feeding, watering, lighting, and ventilationd. Slaughter operations regulated by state and federal inspections3. Turkey production<ol style="list-style-type: none">a. Trend of fewer but larger farms and processing plantsb. Traditionally range raisedc. Trend towards confinement rearing with highly automated feeding and watering systemsd. Typically grown under contract

Instructor Directions	Content Outline
	<ol style="list-style-type: none"> 4. Layers for egg production <ol style="list-style-type: none"> a. Fewer but larger flocks; maximum egg production at minimum costs b. High-producing strains average 285 to 310 eggs over 12- to 14-month laying cycle c. Produced primarily on integrated or contract arrangement 5. Replacement pullets <ol style="list-style-type: none"> a. Raised by egg producers or purchased from hatcheries b. Raised on floors, in cages, or a combination c. Sanitation very important to avoid diseases d. Should not mix ages and strains in same house
<p>Objective 2</p> <p><i>Discuss the facilities and equipment needed in each of the major commercial production systems. Include temperature, moisture, ventilation, and lighting needs for each type of production area.</i></p>	<p>Explain the facilities and equipment required for poultry production systems.</p> <ol style="list-style-type: none"> 1. Small chicks start out in brooder houses. <ol style="list-style-type: none"> a. Special heating equipment needed to keep chicks warm until well-feathered b. Small, trough-type feeding and watering equipment suitable for day-old chicks c. No drafts on floor d. Lighting provided by heating equipment or room lights 2. Pullets <ol style="list-style-type: none"> a. Raised in same house used for brooding or moved to separate housing b. Grown in partial cage system or complete cage system <ol style="list-style-type: none"> 1. Partial cage system - Starts pullets on floor first 6 to 10 weeks, then moved to cages 2. Complete cage system - Grows pullet completely in cage c. Lighting regulated because it affects sexual maturity rate of pullet d. Feeders and waterers placed in convenient locations 3. Layers <ol style="list-style-type: none"> a. Housed in caged systems, open- or slat-floor systems <ol style="list-style-type: none"> 1. Cage systems - Typically multiple-bird cages that hold 5 to 10 birds

Instructor Directions	Content Outline
	<ul style="list-style-type: none"> 2. Open-or slat-floor systems - Result in dirty or broken eggs, stress to hens competing for food, extra cost for litter, and more labor to collect eggs by hand b. Adequate temperature and ventilation required c. Fresh, clean food and water provided automatically or by hand d. Lighting closely regulated e. Egg room needed to hold eggs for market 4. Broilers <ul style="list-style-type: none"> a. Typically raised in large confinement facilities <ul style="list-style-type: none"> 1. Single houses may hold 20,000 to 28,000 birds 2. .75 or .8 square feet allowed per bird b. Partial house brooding utilized with one end restricted until chick is three weeks old <ul style="list-style-type: none"> 1. Maintains and monitors heat available while chicks are young 2. Allowed full range of house when older c. Automated feed and water d. Natural and artificial lighting 5. Turkey poults <ul style="list-style-type: none"> a. Raised in clear-span, metal-roofed buildings b. Provide brooding, growing, finishing or a combination c. Dirt floors covered with absorbent litter material
<p>Objective 3</p> <p><i>Discuss why nutritional needs of poultry are vital to their growth and energy maintenance compared to other farm animals. Review the nutritional needs of poultry and what feed additives may be added to their diet.</i></p>	<p>Explain the nutritional requirements of poultry.</p> <ul style="list-style-type: none"> 1. Birds use nutrients every hour of the day. <ul style="list-style-type: none"> a. Digestion system very rapid b. Respiration and circulation fast c. Grow at a rapid rate d. More sensitive to environmental influences e. Body temperature higher than other farm animals f. Mature at an earlier age 2. Birds are fed complex rations for maximum meat or egg production, fertility, and body maintenance. 3. Feed system is composed of five nutrient classes. <ul style="list-style-type: none"> a. Energy (carbohydrates and fats) <ul style="list-style-type: none"> 1. Provided by carbohydrates 2. Powers the movement of muscles and produces body heat 3. Extra energy stored in the body as fat

Instructor Directions	Content Outline
	<ul style="list-style-type: none"> 4. Sources include animal products (fats) and plant products (grains and vegetable oils) b. Protein provides amino acids, which are the building blocks for cell growth. c. Vitamins are made up of fat- or water-soluble organic substances. <ul style="list-style-type: none"> 1. Aid in digestion, absorption, and metabolism 2. Regulate formation and development of new cells d. Minerals are inorganic elements that help develop bones and eggshells. e. Water helps to absorb nutrients from the digestive tract and aids in metabolic reactions.
<p>Objective 4</p> <p><i>Discuss what is included in wastes and byproducts of poultry. Review management and disposal options and uses for wastes and byproducts.</i></p>	<p>Explain how poultry production wastes and byproducts are utilized and managed.</p> <ul style="list-style-type: none"> 1. Manure, carcasses, and eggs are examples of wastes and byproducts. <ul style="list-style-type: none"> a. 30,000 laying hens can produce 40 tons of manure a month or nearly 500 tons a year. b. Proper handling, storage, and application can protect water resources and increase profits of bird and crop enterprises. c. Animal wastes are a source of plant nutrients for crop production. d. Dried and processed manure is used as animal feed for other livestock. 2. Typical housing systems include cages above dry or liquid pits, floors with litter, and outdoor ranges. <ul style="list-style-type: none"> a. Cages above dry or liquid pits <ul style="list-style-type: none"> 1. Allows manure to fall to a pit or be scraped from boards below cages. 2. Deep pit systems develop into solid manure if kept dry. 3. Manure is scraped or flushed with water from pits directly into spreader or storage. b. Floors with litter <ul style="list-style-type: none"> 1. Remove caked manure from around waterers. 2. Stir to increase drying. 3. Add new litter. 4. Tractor loaders remove manure-litter mixture periodically and pens cleaned and disinfected.

Instructor Directions	Content Outline
Application:	<p>Other activities</p> <ol style="list-style-type: none"> 1. Take a field trip or show a video on a commercial laying house and a broiler house. Compare the similarities and differences. 2. Take a field trip to an older broiler house or laying house. Have students compare the two facilities.
Closure/Summary	<p>Vertical integration and contract systems have made commercial poultry production systems very specialized. Facilities and equipment are also highly specialized with specific requirements for each production system. Nutritional requirements consisting of protein, energy, vitamins, minerals, and water are part of mixed rations for poultry. Waste and byproducts are an important source of nutrients for crop production and provide a means of disposing of the waste.</p>
Evaluation: Quiz	<p>Answers</p> <ol style="list-style-type: none"> 1. When two or more stages of the production, processing, and distribution are controlled by a single firm. 2. Temperature, moisture, ventilation, and lighting 3. Caged systems and open- or slat-floor systems. Cage systems are the most common. Open- or slat-floor systems result in dirty or broken eggs, competition for food, extra cost of litter, and more labor to collect eggs. 4. Any three of the following: rapid digestion, fast respiration and circulation, grow at a rapid rate, more sensitive to environmental influences, body temperature is high, and mature at an early age. 5. 6, 10 6. .75, .8 7. Turkey poults 8. Plant nutrients 9. Cages above dry or liquid pits, floors with litter, outdoor ranges 10. c 11. b 12. f 13. e 14. d