

# **Unit D: Egg Production**

## **Lesson 1: Producing Layers**

**Student Learning Objectives:** Instruction in this lesson should result in students achieving the following objectives:

1. Discuss the materials and equipment needed for the production and growth of layers.
2. Discuss the materials and equipment used in raising mature laying hens.
3. Determine the lighting needed for egg production.
4. Describe the feed ration of a laying hen.

**Recommended Teaching Time:** 3 hours

**Recommended Resources:** The following resources may be useful in teaching this lesson:

- A PowerPoint has also been developed for use with this lesson plan
- [http://msucares.com/poultry/management/poultry\\_care.html](http://msucares.com/poultry/management/poultry_care.html)

## **List of Equipment, Tools, Supplies, and Facilities**

Writing surface  
PowerPoint Projector  
PowerPoint Slides  
Transparency Master copies  
Internet access  
Examples of eggs (optional)  
Layers- chicks and mature (optional but encouraged)

**Terms:** The following terms are presented in this lesson (shown in bold italics and on PowerPoint Slide # 2):

broodiness  
caged layer production  
floor production  
layers

**Interest Approach:** Use an interest approach that will prepare the students for the lesson. Teachers often develop approaches for their unique class and student situations. A possible approach is included here.

**Hold up an egg (or use those provided on PowerPoint slide #3) and ask the students, “Where did this egg come from?” Once they respond “a bird” or “a chicken” ask them “What do you think the bird needed to produce this egg?” Record the students’ responses. Use this activity to lead into the content.**

## Summary of Content and Teaching Strategies

### **Objective 1: Discuss the materials and equipment needed for the production and growth of layers.**

#### **(PowerPoint Slide #4)**

- I. **Layers** are chickens that are used to produce large quantities of eggs.
  - A. Laying hens that are comfortable and given proper environments to grow will be very productive.
  - B. Housing requirements for brooding and rearing chicks and pullets can be quite minimal if done in late spring and summer.
  - C. Almost any small building that meets the floor-space requirements for the desired-size flock can be used.

#### **(PowerPoint Slide #5)**

- D. Equipment for raising layers is similar to that of all poultry.
  - 1. Usually, three sizes of feed hoppers are recommended so that birds, as they are growing, can easily eat without wasting feed.
  - 2. Hanging tube-type feeders that can be adjusted in height as the birds grow are becoming very popular.

**(PowerPoint Slide #6) This slide provides pictures of tube feeders used in layer production. The one on the left is small and can be suspended from the ceiling with either rope or chain. The tube feeder on the right is much taller and can hold more feed but is suspended in the same way.**

#### **(PowerPoint Slide #7)**

- 3. Place a platform under waterers to avoid wet litter and reduce the amount of cleaning required of the house.
- 4. Automatic waterers save labor, even with small flocks.

#### **(PowerPoint Slide #8)**

- E. The house and equipment should be thoroughly cleaned and disinfected before starting chicks.
  - 1. If chicks have been in the house previously, remove all the litter and wash the house and equipment with pressurized water.
  - 2. Scrub and scrape all organic matter from building and equipment surfaces.

3. After cleaning, disinfect building and equipment using an approved compound according to the product manufacturer's directions.
4. Dry and air the building and then place 5 to 10 cm of wood shavings, straw, or other litter material on the floor.

**(PowerPoint Slide #9)**

- F. Place a cardboard fence around the brooding area to confine the chicks to the heat source for the first week.
  1. Infrared lamps provide a convenient heat source for brooding chicks.
  2. Use porcelain sockets approved for these lamps and suspend the lamps with a chain or wire (not the electric cord) so they are no closer than 38 cm to the litter.

**(PowerPoint Slide #10) This slide shows various infrared lamps used in heating brooding areas for chicks.**

**(PowerPoint Slide #11)**

- a. If the average brooder house temperature is 10° C, one 250 watt infrared lamp is generally sufficient for heating 80 chicks.
- b. One chick can be added to this estimate for every degree over 10° C.

**(PowerPoint Slide #12)**

3. You should use more than one lamp so the chicks will not be without heat if a lamp burns out.
  - a. Supply more heat by lowering the lamps to 38 cm above the litter or by using more or higher-wattage lamps.
  - b. To reduce heat, turn off some lamps, use smaller lamps, or raise the lamps to 70 cm above the litter.

**(PowerPoint Slide #13)**

4. Only the chicks are being heated and not the air, so air temperature measurements cannot be used as a guide to chick comfort when using infrared lamps.

**(PowerPoint Slide #14)**

- G. Provide 15 square centimeters of brooder house space per chick from 1 day to 6 weeks of age.

**(PowerPoint Slide #15)**

- H. Place feed on box lids or trays from cut-down card-board boxes for the first few days.
  1. Feed and water should be available to the chicks as soon as they arrive.
  2. Provide 2.54 lineal centimeters of feeding space per chick at the hoppers at first and increase to about 5 centimeters after chicks are 2 weeks old.

**(PowerPoint Slide #16)**

3. After 8 weeks, provide 7.5 to 10 cm of feeding space for growing pullets. A hanging tube-type feeder 38 centimeters in diameter will feed about 30 birds.
4. Less feed is wasted by filling hoppers only half full and adjusting feeder height or size to bird size.
5. Provide a 3.7 L water fountain per 50 chicks during the first 2 weeks, Increase the number or size of waterers from 2 to 10 weeks to provide 1 meter of watering space per 100 birds or 3.7 liter capacity per 10 birds if using fountains.

If chicks are available for observation, allow the students to observe the area where the chicks are being raised. Have students explain how they may take care of baby chicks (keeping them warm, feeding, watering) in their homes or farms.

## Objective 2: Discuss the materials and equipment used in raising mature laying hens.

### (PowerPoint Slide #17)

- II. The housing and management of layer hens can be carried out using one of two methods, **caged layer production** or **floor production**.
  - A. Use of either method can keep the hens in production throughout the year if proper environmental and nutritional needs are met.
  - B. The poultry house should be located away from other farm structures.
  - C. The ground should allow good water drainage.

### (PowerPoint Slide #18)

- D. Adequate light fixtures are needed to provide proper light intensity.
  - 1. Adequate light is present if the water and feed levels in the troughs can be seen after allowing enough time for your eyes to adjust to the dim lighting.
  - 2. Fresh, clean water should be available at all times.

(PowerPoint Slide #19) Notice the lighting in this picture. It has natural light from windows but it also has lighting in the ceiling. Discuss with the students why both forms are beneficial in a poultry house.

### (PowerPoint Slide #20)

- E. The house should allow for plenty of ventilation and sunlight.
  - 1. Place 2.5 centimeter, poultry wire netting over all openings to separate the hens from other birds and animals, both wild and domestic.
  - 2. Removable curtains or doors are recommended so the openings can be opened or closed as the weather changes. Keep the house dry and comfortable by ventilating from all sides in the summer and closing most openings in winter.

### (PowerPoint Slide #21)

- F. The **caged layer production** method consists of placing the hens in wire cages with feed and water being provided to each cage.
  - 1. The birds are housed at a capacity of two to three hens in each cage, which measures approximately 30 cm x 40 cm x 45 cm.
  - 2. The cages are arranged in rows which are placed on leg supports or suspended from the ceiling so the floors of the cages are about 60 to 90 cm above the ground.

### (PowerPoint Slide #22)

- 3. Water is supplied by individual cup waterers or a long trough outside the cages that extends the length of the row of cages.
- 4. The feed trough is also located outside the cages and runs parallel to the water trough on the opposite side of each cage.
- 5. The cages are designed so the eggs will roll out of the cage to a holding area by means of a slanted wire floor.

6. This method of housing is used primarily with egg-type layers kept for infertile egg production.

**(PowerPoint Slide #23)** This slide shows an example of a caged layer production system. In the front bottom of each cage is the food trough. Notice the eggs below the cages. Discuss with the students other methods of egg collection they have seen.

**(PowerPoint Slide #24)**

- G. The **floor production** method is designed for either egg-type or broiler-type birds kept for fertile or infertile eggs.
  1. In commercial flocks this method is used when fertile eggs for hatching are needed.
  2. The birds are maintained in the house on a litter covered floor, giving the term floor production.

**(PowerPoint Slide #25)** This slide illustrates a floor production method of layer raising. Notice the row of waterers in the background and foreground. Ample water is always supplied to the poultry.

**(PowerPoint Slide #26)**

- H. One nest 35.5 cm wide, 30.5 cm high, and 40 cm deep is needed for each four hens.
  1. A mash hopper 1.5 m long and open on both sides is adequate for 25 hens.
  2. Three 11 Liter pans provide adequate watering space for 30 hens.
  3. Clean, scrub and disinfect the house and equipment thoroughly before placing the pullets in the laying house after it has dried.
  4. Put 7 cm of litter material in the nests and 10 to 15 cm of litter on the floor.

**(PowerPoint Slide #27)**

- I. **Broodiness** is often a problem in floor production housing.
  1. It is characterized by a hen wanting to build a permanent nest and begin "setting."
  2. The problem can be solved by removing the hen from the flock and placing her in a wire-floored cage for 3 to 4 days.
  3. Ample feed and water should be supplied to the affected hen.
  4. The hen can then usually be returned to the flock with no further problem.
  5. The treatment can be repeated if the hen continues to be broody.

If hens are available for observation, allow the students to observe the area where they are being raised.

### **Objective 3: Determine the lighting needed for egg production.**

**(PowerPoint Slide #28)**

- III. Regardless of which production method is used, the 22-week old pullets should be given an increased daily light schedule after being placed in the laying house.
  - A. The length of daily light should be increased 15 minutes each week after the birds enter the laying house.

**(PowerPoint Slide #29)**

1. The increased light will stimulate egg production and help maintain production throughout the year.
2. The day length increases should continue until the birds are receiving 16-18 hours of light each day.
3. The day length should remain the same for the rest of the laying period.

**(PowerPoint Slide #30)**

- B. After the birds begin to produce eggs, the total duration of light, including both natural and artificial, should not be reduced.

Show TM: D1-1 to the students. This chart shows a lighting program used for laying hens. Discuss with the students how this program can be achieved. Ask the students why they think light has an effect on egg production. It is because as chickens were evolving, they would wait to produce eggs during the spring and summer to ensure their chicks survived. The day length during the spring and summer is very long compared to the winter. By using an artificial lighting program, hens can be forced to produce eggs.

## **Objective 4: Describe the feed ration of a laying hen**

**(PowerPoint Slide #31)**

- IV. Providing the proper nutrition is not only important to the bird but also to the formation of eggs.
  - A. The birds should be fed a nutritionally balanced commercial laying mash containing 16 percent protein.
    1. Calcium is the most critical element in the feed because it is crucial to the development of eggshells.
    2. Lack of calcium can result in thin egg shells which can break before hatching.

**(PowerPoint Slide #32)**

- B. Use a special breeder ration if the eggs are being saved for hatching purposes.
  1. These breeder diets contain higher levels of vitamins that help produce higher hatchability and healthier chicks.
- C. Poultry older than 16-18 weeks do not require a ration containing a coccidiostat unless a coccidiosis outbreak occurs.
- D. If a commercially produced layer ration is provided, additional oyster shell, grit or grain is not needed.

**(PowerPoint Slide #33)**

- E. A starter mash is generally fed for the first 6 to 8 weeks.
  1. Pullets are then fed a grower or developer mash until they are ready to lay at about 20 weeks of age.
  2. They should be fed a laying mash when they start to lay eggs.
- F. Pullets having access to a yard or range can supplement their diet with green feed.
  1. Chicks or pullets should have some chick- or pullet- size grit available at the appropriate age.

**Have the students create a chart that compares feed rations of full grown birds, both layers and broilers. Provide them with textbooks and internet access to research the feeds.**

**Review/Summary:** Use the student learning objectives to summarize the lesson. Have students explain the content associated with each objective. Student responses can be used to determine which objectives need to be reviewed or re-taught with a different approach. Questions on **PowerPoint Slide #34** can also be used.

**Application:** Invite a poultry producer to come into the class and discuss their egg production. Have the producer discuss their feeding and management practices. Allow the students to ask questions about the producer's operation.

**Evaluation:** Evaluation should focus on student achievement of this lesson's objectives. A sample written test is attached.

## **Answers to Sample Test:**

### **Matching**

1. B
2. D
3. A
4. C

### **True or False**

5. TRUE
6. FALSE- natural and artificial light should NOT be reduced
7. TRUE
8. TRUE
9. FALSE- starter mash should be fed for the first 6 to 8 weeks

### **Short Answer**

10. As chickens were evolving, they would wait to produce eggs during the spring and summer to ensure their chicks survived. The day length during the spring and summer is very long compared to the winter. By using an artificial lighting program, hens can be forced to produce eggs.

# Sample Test

Name \_\_\_\_\_

# Test

## Unit D Lesson 1: Producing Layers

### Part One: Matching

Instructions. Write the letter of the correct answer next to the statement.

- A. Broodiness      B. Layers      C. Floor production      D. Caged layer production

- \_\_\_ 1. Chickens that are used to produce large quantities of eggs.  
\_\_\_ 2. Consists of placing the hens in wire cages with feed and water being provided to each cage.  
\_\_\_ 3. It is characterized by a hen wanting to build a permanent nest and begin "setting."  
\_\_\_ 4. Designed for either egg-type or broiler-type birds kept for fertile or infertile eggs.

### Part Two: True or False

Instructions. Read each statement. If the statement is true write T in the blank, if it is false write F in the blank. If the statement is False, write the correct statement below it.

Example:

F Eggs for human consumption are produced by cows.

Correct statement: Eggs for human consumption are produced by poultry

- \_\_\_ 5. Calcium is the most critical element in a layer's diet.  
\_\_\_ 6. After the birds begin to produce eggs, the total duration of light, including both natural and artificial, should be reduced.  
\_\_\_ 7. Floor production tends to cause broodiness more than caged production.  
\_\_\_ 8. The housing unit for chicks should be thoroughly cleaned in between flocks.  
\_\_\_ 9. A starter mash should be fed up until the time a layer begins to produce eggs.

### Part Three: Short Answer

Instructions: Provide a short statement to answer the following question.

10. What is the evolutionary correlation between day length and egg production?

TM: D1-1

## Layer Lighting Program

Age	<i>Amount of Light (L) and Dark (D)</i>
0 to 3 Days	22(L):2(D)
3 days to 1 Week	20(L):4(D)
1 to 2 Week	18(L):6(D)
2 to 3 Week	16(L):8(D)
3 to 8 Week	14.5(L):9.5(D)
9 Week	14(L):10(D)
10 Week	13.75(L):10.25(D)
11 Week	13.50(L):10.50(D)
12 Week	13.25(L):10.75(D)
13 Week	13.0(L):11.0(D)
14 Week	12.75(L):11.25(D)
15 - 17 Week	12.5(L):11.50(D)
18 Week	13.50(L):10.50(D)
19 Week	14.5(L):9.5(D)
20 Week	15(L):9(D)
21 Week	15.5(L):8.5(D)
22 Week	15.75(L):8.25(D)
23 Week	16(L):8(D)
24 Week	16.25(L):7.75(D)
25 Week throughout production cycle	16.5(L):7.5(D)