

# Poultry Production (Provide Feeds and Implement Feeding Practices) Module 3

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**Department of Education  
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<b>Content Standard</b>	<b>Performance Standard</b>
The learner demonstrates understanding and skills on proper brooding of chicks.	The learner demonstrates independently the skills and attitudes required in brooding.

## **MODULE 3: Brooding**

### **I. INTRODUCTION**

Brooding is the process of extending the necessary heat to the chicks to make them warm and comfortable through natural or artificial means. This Module will provide the learners information on how to accomplish brooding as the foundation of all poultry production. Without the ability of learners and prospective raisers to do proper brooding practices, the success of the poultry project is at risk.

In general, this Module covers the knowledge, skills, and attitudes in successful brooding management for poultry enterprise.

### **II. LEARNING COMPETENCIES**

At the end of the Module, you should be able to:

1. demonstrate the systems of brooding.
2. provide conditions for successful brooding, and
3. perform and observe transferring of birds from the brooder to the growing/laying house.

### III. PRE-/DIANOSTIC ASSESSMENT

Let us find out how much you know about brooding. Answer the following test items; write the letter only of your answer in your activity notebook.

1. Which statement best defines brooding?
  - a. The process of providing chicks with proper temperature naturally or artificially to make them warm and comfortable
  - b. The act of separating the male from the female birds
  - c. The process of separating the productive from the unproductive bird
  - d. The process of providing birds with proper ventilation
  
2. Which among the choices below is considered the oldest-known brooder?
  - a. Electric brooder
  - b. Kerosene lamp brooder
  - c. Laying hens
  - d. Mother hen
  
3. Brooder temperature is too low when chicks\_\_\_\_\_.
  - a. drink more than they can take
  - b. open their wings and chirp
  - c. pile one on top of the other near the source of heat
  - d. spread themselves evenly in the brooder house
  
4. Which factor is NOT essential to an ideal brooder house?
  - a. Capacity of the brooder house
  - b. Design and the construction of the brooder house
  - c. Housing equipment
  - d. Location

5. The ideal space requirement of 100 heads of day-old chicks to three-weeks old "chicks is " \_\_\_\_\_.
- a. 30 sq. ft.
  - b. 50 sq. ft.
  - c. 100 sq. ft.
  - d. 150 sq. ft.
6. Brooder temperature is just right when chicks\_\_\_\_\_.
- a. are evenly distributed inside the brooder house
  - b. are noisy with open wings
  - c. drink less and they are panting
  - d. pile up near the source of light or in the corner
7. When the chicks are moving away from the source of heat it means that the temperature is? \_\_\_\_\_.
- a. moderate
  - b. too high
  - c. too low
  - d. fluctuating
8. The ideal temperature of a brooder during the first week of brooding is\_\_\_\_\_.
- a. 29.4 to 30.2 °C.
  - b. 32.22 to 35 °C.
  - c. 35 to 37.78 °C.
  - d. 37.78 to 40.56 °C.
9. A group of unsexed day old chicks is known as \_\_\_\_\_?
- a. day-old chicks
  - b. chicks
  - c. started chicks
  - d. straight-run chicks

10. Which is NOT an advantage of elevated wire or slat brooding?
- a. Better growth and collection of manures
  - b. Chicks come in contact with their feeds which may trigger the spread of diseases
  - c. Easier collection of manure
  - d. Economical and convenient to use in terms of problems with poultry diseases and parasites
11. The process of giving the necessary attention, care and management to the birds is called \_\_\_\_\_.
- a. brooding
  - b. culling
  - c. laying
  - d. rearing
12. Rapid growth of a chick is affected by their \_\_\_\_\_.
- a. carcass quality
  - b. color of their shank
  - c. feed conversion efficiency
  - d. good fleshing and pigmentation
13. What will be the basis in grouping the chicks using all in all out system?
- a. Age
  - b. Breed
  - c. Color
  - d. Size
14. What should be the characteristic of the facilities inside the rearing house?
- a. Big enough for the birds
  - b. Cleaned and disinfected
  - c. New
  - d. Small
15. Which describes natural brooding?
- a. The required heat needed comes from a mother hen.
  - b. The required heat is supplied with electric bulb.
  - c. The required heat is supplied through a charcoal.
  - d. The required heat is supplied by the birds themselves brooding.

## **IV. READING RESOURCES**

### **LESSON 1**

#### **SYSTEMS OF BROODING**

This Lesson deals with the effective and efficient system of brooding. This learning material will also serve as a means of developing learners who have the potential to undertake brooding management of newly-hatched chicks.

#### **WHAT TO KNOW?**

At the end of this module, you should be able to:

1. identify the system of brooding:
2. perform the necessary preparation in brooding:
3. secure/prepare the materials needed in brooding: and
4. develop awareness in the successful management of poultry.

#### **PROCESS**

Brooding consists mainly in providing the right temperature to the chicks either with natural or artificial source of heat to help maintain their body temperature and for feather development. The mother hen supplies natural heat to its young while chicks hatched in an incubator get heat from a brooder. Brooding is done immediately after newborn chicks are taken out from the incubator. The length of the brooding period may last from two to five weeks depending upon some factors like the rate of feathering of the chicks and the time of year brooding is done.



Brooding can be successfully done all year round. However, provisions for the comfort of chicks during the brooding period should be observed. Chicks should be comfortably housed and protected from inclement weather. Materials and other fixtures in the brooder should always be available to ensure that chicks are given the utmost care and attention they need.

It is best to brood chicks during summer. The brooding period is shortened and fuel expenses are reduced when it is done in warm weather. However, the outbreak of diseases is more common during summer and the rearing of birds will be in time with the rainy season.

### **Materials Needed for Brooding**

- litter materials
- brooding light/source of heat
- chick guard
- brooding house



An example of brooder (Courtesy of RMC-JRS)

Maintain proper temperature inside the brooding house to make chicks feel comfortable.

The ranges of temperature ideals at various ages of broiler chicks are as follows:

Age of Chicks (days)	Temperature (°C)
1-7	32.2-35.0
8-14	29.4-32.2
14-21	26.7-29.4
Beyond 21 days	Provide heat only when necessary

## Types of Brooding

Natural brooding. This is the brooding of chicks with the mother hen or trained capon. Natural brooding is still the most common type of brooding practiced in the rural areas. The hen after hatching the eggs rears her brood through a natural process. A hen can conveniently brood around 12-15 chicks.

Artificial Brooding. It is the process of providing the chicks with the required temperature to make them warm and comfortable.

There are different kinds of chicks to brood. The flock may be composed of any of the following:

- **Straight-run chicks.** A group of chicks composed of an unsexed day old-chicks. This is preferred for the production of meat and egg.
- **Sexed chicks.** These are either all male or female chicks, intended for the production of meat or egg.

1. Clean brooders well before the arrival of chicks.
  - a. Remove feed and water troughs and other equipment from the brooder and bring them outside the brooder house.
  - b. Scrape, sweep, scrub and disinfect the brooder as well as the ceilings, walls, and floors of the brooder house. Do the same thing with the feed and drinking troughs and other equipment in the brooder and in the brooder house.
2. Make a trial run of the brooder one week before the arrival of the chicks.
  - a. Check if the heat regulating system is properly working.
  - b. Buy in advance spare parts that may be needed later.
3. Check if the air circulates properly in the brooder house.
4. Use litter which readily absorb water or moisture.
5. Use two shallow fountain-type of waterers for each tier.



Courtesy of MMFSL Agri. Class

6. Make the brooder rat- and lizard- proof.

7. Allow adequate floor space for:

a. Broiler. This type needs 0.35 sq. ft. per day old chick during brooding:

Age	Floor space requirement
0 – 2 weeks	0.35 sq. ft./bird (brooding period)
2 -4 weeks	0.60 sq. ft./bird
4 weeks to marketing	1.0 sq. ft./bird

b. Replacement chicks (pullets) require 15 – 30 sq. cm./bird, but require more as they grow older.

Age	Floor space requirement
0 -2 weeks	15-30 sq. cm./bird (brooding)
2 – 4 weeks	30-45 sq.cm./bird (brooding)
4 weeks and older	45-60 sq.cm.

8. Remember overcrowding of chicks may result in:

- feather picking and cannibalism (picking the feathers and flesh of others)
- poor digestion and absorption of foods; and
- uneven growth among the chicks in the group because some can eat more than the others

## Setting up of Brooder

Materials needed:

- Any available material for chick guard
- Watering trough
- Feeding trough
- Litter materials:
- Rice hull/sawdust
- Old newspaper

## How to Set-up Brooder

- a. Decide how many chicks will be brood.
- b. Compute for the total space requirement.
- c. Set – up chick guard.
- d. Place at least 2 layers of old newspaper to cover the entire area covered by the chick guard.
- e. Pour rice hull/sawdust inside the brooder area 1-2 inches thick.
- f. Place watering and feeding trough enough for the stock.
- g. Set-up source of heat.



Chicks inside a brooder during brooding period (Courtesy of RMC-JRS)

## REFLECT AND UNDERSTAND

Answer the test items below. Write the letter of the correct answer in your activity notebook.

1. The process of providing the necessary heat to the chicks to make them warm and comfortable naturally or artificially is called \_\_\_\_\_.
  - a. Brooding
  - b. Culling
  - c. Hatching
  - d. Heating
  
2. Which group of chicks is composed of unsexed day-old chicks?
  - a. Pullets
  - b. Sexed chicks
  - c. Started chicks
  - d. Straight run chicks
  
3. Which female chicks produced mainly for the production of eggs?
  - a. Sexed chicks
  - b. Started chicks
  - c. Straight-run chicks
  - d. Sexed, started and straight-run chick
  
4. Making a trial run/test of the brooder before the arrival of chicks is made for the purpose of \_\_\_\_\_.
  - a. checking the heat regulating system is properly working.
  - b. determining if air circulates properly inside the brooder.
  - c. buying in advance materials or spare parts that may be needed later.

d. checking the functionality of the heater, air circulation and buying spare parts that may be needed later.

5. Which is NOT an artificial brooding? Heat is provided by \_\_\_\_\_.

- a. charcoal
- b. an electric bulb
- c. a kerosene lamp
- d. a mother hen

## TRANSFER

### Types of Brooding

Listed below are the materials and equipment needed in brooding. Place a check mark in the column to indicate if this item is present, functional, or defective. This undertaking will prepare you for a brooding activity in your class broiler raising project. List down possible problems which you find not ready or not functional and discuss them in the class.

Conditions/equipment/materials	Ready	Functional	Not Functional	Remarks
Brooder ready for brooding				
Brooder properly disinfected				
Litter materials				
Drinking trough				
Feeding trough				
Feeds				
Ventilation inside the brooder				
Source of artificial light				
Brooder properly secured				
Brooder free from drafts				

Space requirement feasible				
Antibiotics/ vitamins				
Open sacks (used to maintain temperature)				

## FEEDBACK

Proper brooding practices are vital for proper growth and development of chicks particularly in the early stages of their growth.

## GLOSSARY

- Artificial brooding** - The rearing of chicks using an artificial source of heat
- Broiler** - are young chicken male or female-intended for meat purposes
- Brooder** - a device used for rearing chicks
- Brooding** - the process of providing chicks with the necessary heat to make them warm and comfortable
- Cannibalism** - act of eating the flesh of the same animal
- Layer** - are matured, egg producing species of poultry, especially chicken
- Natural brooding** - A system of brooding using the mother hen to take care of its young



## RESOURCES

Feeding trough  
Watering trough  
Day old chicks  
Brooder  
Spray tank  
Disinfectants  
Heater  
Electric lamps  
Empty sacks  
Litter materials

## REFERENCES

Anacleto B. Coronel, MS, DVM.,  
A primer on Animal Husbandry,  
Verde Bookstor, 1971.  
Technology and Livelihood Education III.  
Agriculture and Fishery Technology Animal Production,  
SEDP SERIES, 1992  
  
Tech-Voc. Modules (raise poultry)

## LESSON 2

### CONDITIONS FOR SUCCESSFUL BROODING

#### WHAT TO KNOW?

At the end of the Module, students should be able to:

1. enumerate the requirements and conditions in brooding;
2. identify other ideal requirements and conditions for a successful brooding;
3. observe proper ventilation inside the brooder; and
4. appreciate the importance of effective and efficient rearing of newly-hatched chicks.

#### PROCESS

##### Sources of Heat for Artificial Brooding

Electricity. Electricity is the common source of heat in big brooders that accommodate a large number of chicks. An incandescent bulb which is normally raised 15 cm above the floor of the brooder is used to provide the desired heat needed by the chicks. It is the most convenient and the most reliable source of heat. One (1) watt per head is required.



Chicks provided by heat through electric bulb (Courtesy of RMC-JRS)

Charcoal, rice hull or wood. This type of artificial brooder is seldom used because it is laborious. The poultry raiser has to make sure that the burning charcoal, wood and rice hulls will not drop to the floor of the poultry house for it causes fire. Heat is difficult to control, thus wider brooder space is needed for the chicks to move away from the heat source in case it becomes too hot. Additional precaution must be observed to avoid fire.



An improvised heater using charcoal and saw dust (Courtesy of RMC-JRS)

Kerosene Lamps. In the area where electricity is not available, these lamps are used as source of heat for only a limited number of chicks. Temperature is regulated by raising or lowering the wick. If a kerosene brooder is used, be sure to provide adequate ventilation. More carbon dioxide will be produced when using kerosene lamps.



Kerosene lamp used in small number of chicks (Courtesy of RMC-JRS)

## SYSTEMS OF BROODING

There are several systems of brooding that one can choose from based on the construction of the poultry house. Select from the following systems of brooding that you want to adopt.

- a. Litter-floor Brooding. This system makes use of the floor as a place for brooding. The litter or the materials used to cover the floor may include rice hulls, wood shavings or sawdust. In this system of brooding, the chicks come in contact with their feeds and this may trigger the spread of diseases. To prevent this, the litter should be changed regularly.



Chicks raised in a litter-floor brooder (Courtesy of RMC-JRS)

- b. Elevated Wire or Slat Brooding. The chicks are kept in elevated pens with floors made of wire mesh or wooden or bamboo slats. This system is more economical and convenient to use than the litter-floor type of brooding in terms of problems with poultry disease and parasites, better growth of chicks, and easier collection of manure.



Elevated Brooder (Courtesy of RMC-JRS)

## **Factors for Successful Brooding**

1. Quality chicks
2. Proper temperature
3. Proper ventilation
4. Adequate space allowance
5. Proper sanitation
6. Adequate lighting facilities
7. Ample protection from the predators

### ***Other Requirements and Conditions in Brooding***

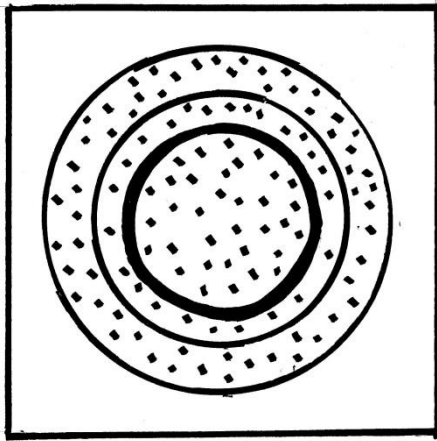
Temperature. The temperature should range from 90-95°F and is gradually reduced weekly until the chicks are finally able to live without heat and are transferred to the growing pen. The behavior of the chicks is a good indicator of the temperature in the brooding pen. The temperature in the brooder is low when the chicks are grouped or crowded very close to the source of the heat. Temperature is ideal and just right when the birds are more or less evenly scattered in the brooding area. On the other hand, when the chicks disperse and move away from the source of heat, it is an indication that temperature is too high.

Watch for, listen, and react for the chick complain.

“Their welfare is your profit. “

#### **A. Right brooding temperature**

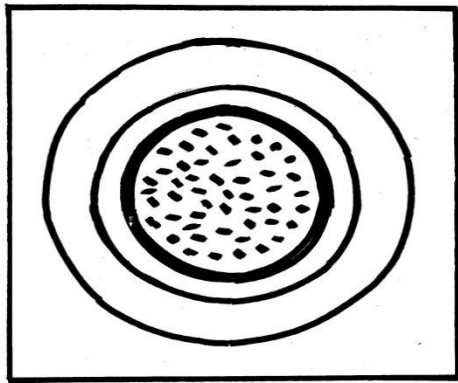
- Chicks are evenly scattered inside the brooding house
- Doing varied activities



Courtesy of RMC-JRS

b. Temperature is extremely low

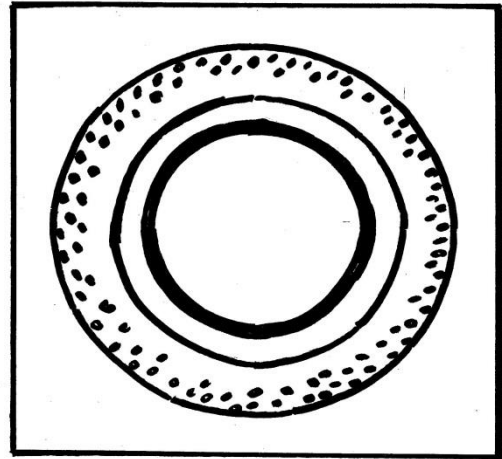
- Chicks pile on the top of the other
- Stay together near the source of heat



Courtesy of RMC-JRS

c. Temperature is too high

- Chicks move away from the source of heat
- Chicks spread their wings panting and drink a lot of water



Courtesy of RMC-JRS

**Humidity.** This refers to the condition of air moisture in the brooder. Too much manure and spilled water accumulated in the brooder can make the pen damp. This damp condition is unsanitary and is conducive to infectious diseases (e.g. coccidiosis) that affects the chicks. This can be prevented by keeping the brooder room dry, replacing defective waterers and changing the litters as often as necessary.

**Ventilation.** This is another factor which contributes to the normal growth of chicks. Ventilation becomes a problem when the brooder house is closed. This results in lack of oxygen and the accumulation of carbon monoxide which may weaken the birds or even cause death.



Brooder house showing good ventilation (Courtesy of RMC-JRS)



**Space Requirements.** Space which is bigger than what is necessary will increase housing cost per chick. On the other hand, providing your chicks with very limited space will result in more outbreaks of disease and slow feathering.

Use the following Table as your guide in providing proper space allowance for chicks and equipment for broiler production.

### **Space Requirement for Growing Birds**

Age of Chicks	Floor Space Sq. ft./head	Feeder (cm/bird)	Waterer (gal/100chicks)
Day old-2 wks	0.3	2.5	0.5

Proper brooding practices are vital for proper growth and development of chicks particularly in the early stages of their lives.

Materials and other fixtures needed in the brooder should always be available to ensure that chicks are given the utmost care and attention they need.

On the 15<sup>th</sup> day broiler chicks are transferred to the growing or finishing house where they can utilize more space for growth. Layer chicks on the other hand are transferred on the 31<sup>st</sup> day.

Chicks should be provided with sufficient feeding and drinking space.

Overcrowding should be avoided.

## REFLECT AND UNDERSTAND

Choose the best answer. Write the letter of the correct answer in your activity notebook.

1. Which best describes a straight – run chick?
  - a. This is a group of chicks composed of an even number of male and female.
  - b. These are either all male and female chicken.
  - c. These are raised mainly for the production of meat or egg.
  - d. These are older chicks that have already been bred for a period of time.
  
2. Which is NOT a characteristic of a good quality chicks for broiler production
  - a. Rapid growth and good feathering ability
  - b. Resistance to common diseases
  - c. Unhealthy looking chicks and stunted in growth
  - d. Well-developed down covering and alert eyes
  
3. Brooder temperature is too cold when chicks\_\_\_\_.
  - a. are noisy, open their wings, and keep on chirping
  - b. eat and drink more than what they need.
  - c. pile one on top of the other near the source of heat.
  - d. all of these
  
4. Brooder temperature is just right when chicks\_\_\_\_.
  - a. are more or less evenly-distributed in the brooding area
  - b. are noisy, open their wings and keep on chirping
  - c. eat less and drink more water
  - d. chicks pile one on top of the other

5. Which factor is least essential considering the design of an ideal brooder house?
- Capacity of the brooder house
  - Design and the construction of the house
  - Housing equipment
  - Location

## **TRANSFER**

Engage in a small scale broiler production as a class in a school-based project. Make a plan and undertake the management of the project in groups applying the knowledge and skills learned in this Module.

## **V. SUMMATIVE ASSESSMENT**

Read the questions carefully and write the letter of your choice on your answer sheet.

- Which statement best defines brooding?
  - The process of providing chicks with proper temperature naturally or artificially to make them warm and comfortable
  - The act of separating the male from the female birds
  - The process of separating the productive from the unproductive bird
  - The process of providing birds with proper ventilation
- Which is considered the oldest-known brooder?
  - Electric brooder
  - Kerosene lamp brooder
  - Laying hens
  - Mother hen

3. Brooder temperature is too low when chicks\_\_\_\_\_.
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  - c. pile one on top of the other near the source of heat
  - d. spread themselves evenly in the brooder house
  
4. Which factor is NOT essential to an ideal brooder house?
  - a. Capacity of the brooder house
  - b. Design and the construction of the brooder house
  - c. Housing equipment
  - d. Location
  
5. The ideal space requirement of 100 heads of day-old chicks to three–weeks old “chicks is “\_\_\_\_\_”.
  - a. 30 sq. ft.
  - b. 50 sq. ft.
  - c. 100 sq. ft.
  - d. 150 sq. ft.
  
6. Brooder temperature is just right when chicks\_\_\_\_\_.
  - a. are evenly distributed inside the brooder house
  - b. are noisy with open wings
  - c. drink less and they are panting
  - d. pile up near the source of light or in the corner
  
7. When the chicks are moving away from the source of heat it means that the temperature is? \_\_\_\_\_.
  - a. moderate
  - b. too high
  - c. too low
  - d. fluctuating
  
8. The ideal temperature of a brooder during the first week of brooding is\_\_\_\_\_.
  - a. 29.4 to 30.2 °C.
  - b. 32.22 to 35 °C.
  - c. 35 to 37.78 ° C.
  - d. 37.78 to 40.56 °C.

9. A group of chicks composed of an even number of males and females is known as \_\_\_\_\_.
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  - chicks
  - started chicks
  - straight-run chicks
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- Better growth and collection of manures
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  - Economical and convenient to use in terms of problems with poultry diseases and parasites
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  - Color
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  - b. Cleaned and disinfected
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15. Which describes natural brooding?
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  - b. The required heat is supplied with electric bulb.
  - c. The required heat is supplied through a charcoal.
  - d. The required heat is supplied by the birds themselves brooding.

## **VI. SUMMARY/ FEEDBACK**

Brooding is one of the important aspects of poultry production that can determine the success and failure of the project at the early stage of operation. The level of rearing activities as well as the amount of investment may greatly be influenced by brooding. Proper brooding, and rearing of stocks also needs knowledge and skills in maintaining birds health and sanitation which will be taken in the next Module.

## **RESOURCES**

Litter materials (old newspaper,  
empty feed bags, rice  
hulls, etc.)

Stocks

Incandescent bulbs

Feeders and waterers

Veterinary supplies

Feeds

Weighing scale

Sprayer tank

## GLOSSARY

- Adequate** – meeting the requirements
- Brooding** – process of providing artificial heat to the birds from day old till the time that they can control their body heat
- Crowded** – a large number of birds in a limited space, no more room for movement
- Fixtures** – anything fixed in its place
- Humidity** – the condition of air moisture in the brooder
- Litter** – materials used to cover floor space
- Requirements** – things needed
- Ventilation** – the circulation of air inside and outside the brooder

## REFERENCES

Anacleto B. Coronel ,MS, DMV., Primer of animal Husbandry, Verde Bookstore, 1971

Technology and Home Economics III Agriculture and Fishery,  
Technology. Animal Production SEDP SERIES, 1992

Tech-Voc. Modules (raise poultry)

Tips on broiler production Retrieved Aug 19, 2011

<https://www.google.com.ph/search?>