# Kansas 4-H Poultry Leader Notebook

*Level IV*

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Advancing by Setting Long-Term Goals
Poultry, Level IV

What Members Will Learn . . .

ABOUT THE PROJECT:
• Setting goals

ABOUT THEMSELVES:
• The importance of setting goals

MATERIALS NEEDED:
• Poultry Member Guide and Annual Report (MG-26)
• Activity Sheet 1, Preparing Long-Term Goals

ACTIVITY TIME NEEDED: 60 MINUTES

ACTIVITY:
Because of your involvement and achievements in past poultry projects, you will now be helping other project members by sharing the information and knowledge you have gained about poultry.

As a junior leader, you also will be reviewing your own goals.

Your progress throughout Level IV is an important part of your poultry project. Sometimes, setting long-term goals is difficult and, therefore, we do not do it. But in Level IV, we have made places for you to look at your progress.

Setting long-term goals does not need to be intense or elaborate. Rather, it should be simple and to the point. If you take time to review your long-term goals, you will have a better chance of reaching those goals.

Goals can be long-term or short-term. When using the Poultry Member Guide and Annual Report for Level IV, let’s make both goals long-term—something you plan to do in two to five years.

Many of the things you have been learning in your poultry projects are skills that are transferable to long-term goals, such as obtaining more education, getting a job, winning a scholarship or even pursuing a career.

Now that you have completed the activity sheet, let’s fill out the Poultry Member Guide and Annual Report using these two long-term goals.

Leader Notes

Complete MAP STEPS one to seven.

Pass out Activity Sheet 1, Preparing Long-Term Goals, and fill in the blanks.
DIALOGUE FOR CRITICAL THINKING:
Share:
1. What were your two goals?
2. What did you like most about this activity?

Process:
3. Why is it important to review your long-term goals?
4. What skills do you have that you can use in other projects, activities or situations?

Generalize:
5. What did you learn about yourself from this activity?

Apply:
6. How will you apply what you have learned to other situations?

GOING FURTHER:
• Develop a job résumé.
• Discuss developing a personal portfolio of your skills with a school counselor.

REFERENCES:
Author:
Gwen Bailey, Consultant; James P. Adams, Extension Specialist, 4-H Youth Programs, Kansas State University

Reviewed By:
Poultry Design Team
ADVANCING BY SETTING LONG-TERM GOALS
POULTRY, LEVEL IV
Activity Sheet 1, Preparing Long-Term Goals

Long-term goals define your future. Select two of the following long-term goals you might work on in Level IV.

CHECK TWO (of your choice)

_____ acquire more education
_____ get a job
_____ win a scholarship
_____ select a career path
_____ other ________________________________
_____ other ________________________________

Now take one of these long-term goals and answer the following questions. One of my long-term goals is to:

____________________________________________________________________________________

I hope to eventually use this long-term goal. I plan to reach this goal by:

____________________________________________________________________________________

To reach this long-term goal I will use my abilities of:

____________________________________________________________________________________

To reach this long-term goal I will need to improve on:

____________________________________________________________________________________

When I reach my goal in the future, I will know it has been met by:

____________________________________________________________________________________
Game Bird Production

Poultry, Level IV

What Members Will Learn . . .

ABOUT THE PROJECT:
- Specific management techniques in order to raise selected game birds
- Marketing strategies for specific species
- Specialty markets available for desired species
- Hunting and recreation available for desired species

ABOUT THEMSELVES:
- Their feelings about hunting (killing or harvesting) nature’s game birds
- Their feelings on operating hunting reserves for profit
- Their opinion on raising game birds for specialty food markets

Materials Needed:

ACTIVITY TIME NEEDED: 60 TO 120 MINUTES

ACTIVITY:

There are several reasons for raising game birds. Some people raise game birds for their beauty, particularly the more colorful and unusual species. Some states encourage youth to raise game birds such as ring-necked pheasants for release, to improve the natural population. Also, game birds are raised as a business enterprise. Examples are raising game birds for release on private and/or public hunting areas, or for processing and sale as a gourmet food item.

The species of game birds that can be successfully grown under domesticated conditions are bobwhite quail, ring-necked pheasants, chukar or Hungarian partridges, wild turkeys and mallard ducks. The ring-necked pheasant and partridge were successfully introduced into the United States from other countries because they were placed in habitats similar to their native countries. Game birds are grown much like chickens and turkeys, except they require enclosed pens so they can’t fly away.

Except for mallard ducks, the main food of game birds is weed seeds, berries, insects and various forms of green vegetation. Where water is not present, upland game birds obtain their necessary moisture by eating various types of succulent green plants or insects.

The bobwhite quail is a very popular game bird. It is found in most areas of Kansas, particularly the eastern half of the state. Its exploding flush and fast darting flight make it a challenge to hunters. The bobwhite is mainly a farmland bird preferring a combination of cultivated fields, woodlots, brush and weed patches for its habitat. Bobwhite quail usually raise one
brood (or family) per summer. The brood remains together through the summer and sometimes joins other broods or individuals to form coveys in the fall. Bobwhite quail weigh 6 to 8 ounces.

Other species of quail found in the United States are the California or valley, mountain, Gambel’s or desert, scaled or blue, and Mearn’s. The Japanese, coturnix or Pharoah’s quail, is native to Europe and Asia and dates back to the ancient civilizations of those countries. Coturnix quail are easy to raise because they are hardy, easy to handle and require simple equipment. They have a short reproductive cycle, and may lay eggs when only 35 days old. The adult birds weigh between 4 to 5 ounces. Attempts to establish the specie in the wild have not been successful.

The chukar or rock partridge is found in the mountainous states which have an arid mountainous habitat similar to the chukar’s native habitat of Europe and Asia. Chukars weigh between 1 and 1½ pounds. The gray or Hungarian partridge, sometimes referred to as the “Hun,” is found mainly on farmed prairies in the Northern United States and Southern Canada.

The ring-necked pheasant is considered by many people to be the king of game birds, probably because of its size and the beautiful feathers of the male. Farmed prairies are the bird’s ideal habitat. Adult pheasants weigh between 2 and 3 pounds.

The mallard duck is the most popular species of waterfowl and the easiest to raise and propagate in captivity. In addition to its ability to adapt to pen conditions, the adult mallard is relatively free of disease and requires a minimum of shelter in the most severe weather. Their acceptance of pen conditions is primarily controlled by the availability of food and water. Mallards are raised primarily for farm ponds.

The wild turkey is the largest upland game bird in the United States. An adult gobbler will sometimes weigh more than 20 pounds.

Turkeys were originally found throughout the United States and Mexico. There are six races of wild turkeys with the Eastern being the most common. Our present domesticated varieties of turkeys originated from the Mexican race. Spanish explorers took the Mexican race back to Europe. This stock gave rise to several varieties, which were brought to the continent by the settlers. Present-day varieties such as the Broad Breast Bronze were developed from crosses of these varieties and the Eastern wild turkey.

Wild turkeys have been successfully introduced into Kansas and other parts of the United States. Preferred habitat for the turkey is wooded areas with scattered openings. Turkeys are polygamous (one male mating with several females) and raise only one brood of young (poults) each year.
Your first decision is to choose a specific bird to study for possible production.

After you have chosen a species, consider gathering information in these categories:

1. Techniques unique to raising and management of selected bird
2. Marketing strategies
   • Food markets
   • Hunting and recreation possibilities

Consider the following activities for your species:
1. Visit a game bird reserve.
2. Do a grocery store search and list all game bird food items available.
3. Collect breed, Research and Extension or other management-type bulletins.
4. Check for slide sets, videos, or movies from Research and Extension or public libraries.
5. Visit university or private research facilities.
6. Have a discussion with friends or club members on the importance of game birds for recreation.
7. Research specialty markets that might be available.
8. Have a discussion on the pros and cons of hunting and animal welfare issues.

**DIALOGUE FOR CRITICAL THINKING:**

**Share:**
1. What game bird did you study? Why?
2. What was the most unusual or different situation you encountered? Why?

**Process:**
3. Which game birds are easiest to raise? Why?
4. What problems occurred in the species chosen by your group? Why?

**Generalize:**
5. What is your position or thoughts on hunting game birds? Discuss the extremes in thinking as to whether hunting is harvesting to assist the balance of nature, or killing a valuable life, or simply a sport.
6. What are your feelings about raising game birds? Is it a business? Hobby? Or raising a food commodity?
Leader Notes

Apply:
7. How will the issues raised by this activity be useful in the future?

8. What would you do differently if you studied this topic again? Why?

GOING FURTHER:
- Give a presentation to civic groups on a game bird issue or topic.
- Invite a wildlife specialist or game warden to your meeting.
- Lead a public forum on one of these issues pertinent to your area.

REFERENCES:
Raising Game Birds, Leaflet 21046, AHR Publications, University of California, 6701 San Pablo Ave, Oakland, California, 94608 ($2.50)
Bobwhite Quail Production, Kansas State University Animal Sciences and Industry, Call Hall, Manhattan, Kansas, 66506-1600

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10-Poultry, Level IV
ABCs of Poultry Genetics

Poultry, Level IV

What Members Will Learn . . .

ABOUT THE PROJECT:
• Five genetic terms and their definitions
• To identify and define three breeding systems
• To identify and define five selection and culling methods

ABOUT THEMSELVES:
• Genetic principles important to people
• How genetics might affect their life

Materials Needed:
• Pictures of several different breeds and varieties of poultry
• Paper and pencils
• Chalkboard
• Member Handout 1, Inheritance Examples

ACTIVITY TIME NEEDED: 45 MINUTES

ACTIVITY:

It is important for those engaged in poultry raising to have a basic understanding of the principles of poultry breeding. Knowing these principles will aid in understanding and choosing the right type, strain, breed and variety of poultry.

Since wild fowl were first domesticated, there have been many changes through selective breeding programs. Most likely, chickens were first selected on their fighting ability. Then in the late 1800s, breeders placed major emphasis on the appearance of the birds, such as comb type and feather color. Many of the American breeds and varieties of chickens were developed during this era. In recent years, breeders have placed major emphasis on selection for efficient egg and meat production.

What a bird looks like and how it performs are influenced by the genetic traits it inherits from its parents and the environment in which it lives.

Chromosomes are the carriers of the genes that are the basic units of inheritance. Each species of animal has a definite number of chromosomes. The chicken has 39 pairs of chromosomes. Genetic traits may be dominant or recessive. A dominant gene is one that exerts its influence over its recessive counterpart. Dominance may vary from partial to complete.

Leader Notes

Using pictures or illustrations, have youth discuss differences in the physical appearance of various breeds and varieties of poultry.
The genetic traits which are inherited by an individual bird may express themselves in two ways, physically or qualitatively (those we can see) such as body shape, comb type, and feather color, and physiologically or quantitatively (those we can’t see) such as egg production, growth rate and broodiness.

Qualitative traits are clearly expressed in the physical appearance of the bird and are usually controlled by one or two gene pairs. The environment has little influence on the expression of qualitative traits. Following are some important qualitative traits of chickens:

1. **Feather Color.** White- or light-colored feathering is very important in the breeding of meat-type poultry because they look cleaner when processed than birds with dark-colored feathers. Mating a dominant white bird with a colored female will produce predominantly white-feathered offspring.

2. **Skin Color.** Most breeds and varieties of chickens have either white or yellow-colored skin. Since most breeds developed in the United States have yellow skin, yellow-skinned broilers are preferred in most markets.

3. **Sex Determination.** Of the 39 pairs of chicken chromosomes, 38 have similar size and shape within pairs and are called autosomes. The other pair contains similar members in the male, (ZZ) chromosomes, and one different member in the female, (ZW) chromosomes. The Z chromosome carries genes just like the autosomes, but the W chromosome carries few or no genes and appears to function primarily in sex determination. Thus, the female bird determines the sex of the offspring.

The lack of a second Z sex chromosome in the female is of some economic importance. Certain traits, such as rate of feathering and some plumage colors (barred, silver, gold), are carried on the Z sex chromosome. These genes are said to be sex-linked, and when used in a proper cross can be used to determine the sex of day-old chicks by differences in the appearance of their feathers.

Variability of quantitative traits among individuals is measured numerically, such as number of eggs laid per hen or average body weight. Quantitative traits are usually influenced by several gene pairs. If selection for one trait indirectly improves another trait, the traits have a positive genetic correlation. For example, selection for small body size in egg-type chickens improves feed efficiency. A negative genetic correlation is when improvement in one trait results in deterioration of another trait. Using the previous example, selection for smaller body size would result in smaller eggs.

Performance of poultry is a combination of the influences of heredity and the environment. Heritability is the sum of the genetic forces that are expressed through a particular gene or combination of genes. The environ-
ment is the sum of the nongenetic forces that influence gene expression. Traits with low heritability are greatly influenced by the environment. Examples are fertility and disease resistance. Examples of traits with high heritability are shell color and egg weight.

**Selection** for egg production and meat production is very complex since it involves continuous selection for improvement in many factors. The primary traits affecting egg production are age at sexual maturity, rate of lay, livability, body size, egg size, egg quality and shell color. Major traits affecting meat production are rate of growth, body conformation and fleshing, amount and distribution of fat, feathering, feed conversion and carcass grade and yield.

Poultry breeders use different breeding systems to improve the performance of poultry. Most of the systems involve some type of crossing.

1. **Purebreeds.** Mating birds of the same breed or variety. Maintenance of purebred lines is essential to supply stocks for other breeding systems.

2. **Inbreeding.** This involves mating closely related individuals such as brother and sister. Its purpose is to expose adverse recessive genes. Inbreeding adversely affects such traits as livability, fertility and hatchability.

3. **Crossing.** The purpose of crossing is to increase hybrid vigor. **Crossbreeding** involves mating different breeds or varieties such as a Rhode Island Red cockerel and a White Leghorn pullet. **Incrossing** involves crossing two inbred lines of the same breed or variety. **Strain crossing** is the mating of two distinct, non-inbred strains of the same breed or variety. Most commercial chickens and turkeys are produced by strain crossing.

**Culling** the flock is a very important management tool. It involves the removal of undesirable birds from the flock. Three basic reasons for culling are to salvage the poor producers while they still have some value, to improve the production efficiency of the flock by removal of the loafers, and to prevent the spread of disease. Culling is most commonly practiced in small flocks.

**Selection** refers to selecting candidates for the breeding flock. Both physical appearance and performance records are used in selection of potential breeders. **Mass selection** is based on selection of desirable individuals without regard to the productivity of their relatives. **Family selection** involves selecting breeders on the basis of their ancestors’ performance, such as pedigree selection, sibs’ performance, progeny’s performance, or a combination of these. **Index selection** is based on a combination of information from various sources and usually involves individual plus family selection.
**Leader Notes**

**DIALOGUE FOR CRITICAL THINKING:**

**Share:**
1. When you mapped various genetic matings, what trends or unusual results did you discover?

2. What aspects of genetics are easy or hard to understand?

**Process:**
3. What is the difference between genotype and phenotype?

4. What is the difference between qualitative and quantitative traits?

5. What are the three basic reasons for culling?

**Generalize:**
6. What did you learn about yourself during this activity?

7. Which of these genetic principles are important in human genetics? Why? Give examples.

**Apply:**
8. How do you think your understanding of genetics will help you in the future? Why?

**GOING FURTHER:**
1. Give a presentation about simple genetics to a group.
2. Visit a poultry breeder and discuss mating systems.
3. Visit a poultry research facility to see what genetic research is being done.

**REFERENCES:**
*Poultry Science Manual*, Department of Animal Sciences and Industry, Kansas State University.

*Poultry Science*, Ensminger.
Example 1. Inheritance of comb type in chickens.

<table>
<thead>
<tr>
<th>Genotypes and phenotypes of parents</th>
<th>Genotypes and phenotypes of progeny</th>
</tr>
</thead>
<tbody>
<tr>
<td>RR (rose) × RR (rose)</td>
<td>RR (rose)*</td>
</tr>
<tr>
<td>RR (rose) × rr (single)</td>
<td>Rr (rose)</td>
</tr>
<tr>
<td>Rr (rose) × Rr (rose)</td>
<td>Rr (rose)</td>
</tr>
<tr>
<td>RR (rose) × Rr (rose)</td>
<td>Rr (rose)</td>
</tr>
<tr>
<td>Rr (rose) × rr (single)</td>
<td>Rr (rose)</td>
</tr>
<tr>
<td>rr (single) × rr (single)</td>
<td>rr (single)</td>
</tr>
</tbody>
</table>

* Rose comb is dominant to single comb.

Example 2. Illustration of sex-linked genes in chickens, a Rhode Island cockerel mated to a Barred Rock pullet.

<table>
<thead>
<tr>
<th>Genotypes and phenotypes of parents</th>
<th>Genotypes and phenotypes of progeny</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rhode Island cockerel × Barred Rock pullet</td>
<td>Bb (barred)* - all cockerels</td>
</tr>
<tr>
<td>bb (nonbarred) × BW (barred)</td>
<td>bW (nonbarred) - all pullets</td>
</tr>
</tbody>
</table>

* Barring is dominant to nonbarring.
What Members Will Learn . . .

ABOUT THE PROJECT:
- How to create an egg window in an incubating egg
- To recognize the heart pulsations in the young chick embryo
- Stages of embryonic development

ABOUT THEMSELVES:
- The embryonic development of other animals compared to a chick
- Their feelings about observing embryonic development

Materials Needed:
- Fertile chicken eggs that have been incubated 48 hours
- Tweezers
- Scissors
- Cellophane tape or plastic wrap
- Member Handout 2, Important Events in Embryonic Development
- Member Handout 3, Embryo Development at 5, 10, 15 and 20 Days

ACTIVITY TIME NEEDED: 60 MINUTES

ACTIVITY:

One of the greatest miracles of nature is the rapid transformation of a seemingly lifeless egg into a new, living organism, the chick. The developing chick embryo offers a rare opportunity for you to study the various stages of development in its embryonic growth, such as the early heartbeat or the embryo exercising back and forth in its small encasement.

Since the embryo actually starts to develop with the formation of the egg within the hen’s body, it’s important to understand the formation of the egg to fully understand embryonic development.

Fertilization takes place as the ovum enters the funnel, or infundibulum, if viable sperm are present. Many sperm contact the germinal disc on the ovum, or yolk, but only one unites with the female germ cell. Thus, fertilization occurs about 24 hours before the egg is laid. Since the fertilized germinal disc or blastoderm spends about 24 hours in the warmth of the hen’s body (107°F) while the egg is being formed, a number of cell divisions (4,000 to 6,000) take place before the egg is laid.

If, after the egg is laid, its temperature drops below 80°F, development ceases. Holding fertile eggs at temperatures above 80°F prior to incubation causes slow embryonic growth resulting in a weak embryo and ultimately a poor hatch. Thus, it is necessary to store hatching eggs at temperatures of 60° to 65°F prior to incubation.
The successful structural development of the embryo from a microscopic spot to a structure filling the entire shell is dependent upon the proper functioning of the processes of respiration, excretion, metabolism and protection. In observing the living embryo, you should be familiar with the special temporary organs, or embryonic membranes formed within the egg to fulfill these functions. These organs are the **yolk sac**, **amnion** and **allantois**.

The **yolk sac** is a vascular membrane growing over the surface of the yolk. Its function is to supply food material to both the developing embryo and the chick the first few hours after it is hatched.

The **amnion** encases the embryo in a colorless fluid and provides protection from mechanical shock and permits the developing embryo to exercise.

The **allantois** serves as a respiratory organ and a reservoir for excreta. It absorbs albumen, which serves as a nutrient, and calcium for the structural needs of the embryo.

**Activity—Study the Beating Heart**

1. By the time the chicken embryo has incubated 48 hours, the first sign of life, the exposed beating heart, is evident to the naked eye.

2. Carefully crack the blunt or large end of the shell with the heavy end of the tweezers. Flake away a few small pieces of shell. Using the scissors, cut the shell as far down as the inner shell membrane, which is the opaque (white) membrane laying on top of the liquid contents of the egg. The outer shell membrane will have been removed with the shell.

3. There may be blood vessels very near to the inner shell membrane. This membrane must be removed carefully in order to not break any of the blood vessels and cause a hemorrhage.

4. As soon as the membrane is successfully removed, you will see a mass of blood vessels covering the yolk and the tiny heart can be seen pulsating with life.

5. If the egg is maintained in the upright position, the heart will continue to beat for several hours even at room temperature.

6. If the opening is covered with plastic wrap or cellophane tape and returned to the incubator in the upright position, the heart may continue to pulsate for some time, perhaps as much as a day.

For all practical purposes, the egg will not hatch after this opening is made as the respiratory balance has been altered. Also, the egg can no longer be turned to facilitate embryonic growth. Experience has indicated, however, that growth may continue for some days. The observer may feel that because the heart can no longer be seen, the embryo may have died, but
you should remember that the heart itself is enclosed within the body cavity approximately 72 hours after incubation is started, so it will no longer be visible.

**DIALOGUE FOR CRITICAL THINKING:**

**Share:**
1. What happened when you cut the window in the egg shell?
2. What was the most difficult aspect of cutting the window in the egg? Why?

**Process:**
3. When does fertilization of the egg take place?
4. Why is there normally no cell growth in the egg between the time it’s laid and when it’s put into the incubator?

**Generalize:**
5. What did you learn about yourself by observing chick embryonic development?
6. What are the major differences between chick embryo development and embryo development in other animal species?

**Apply:**
7. How will the issues raised by this activity be useful in the future?

**GOING FURTHER:**
- Prepare and present a talk or demonstration on embryo development.
- Study different stages of embryonic development by examining eggs from different incubation times.
- Study different incubation periods from different species/breeds.
Think Back:
How important is genetics and embryonic development in the production of game birds as compared to chickens?

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CHICK EMBRYO DEVELOPMENT
POULTRY, LEVEL IV
Member Handout 2, Important Events in Embryonic Development

Before Egg Laying
Fertilization
Division and growth of living cells
Segregation of cells into groups of special function

Between Laying and Incubation
No growth; stage of inactive embryonic life

During Incubation
First Day:
- 16 hours—First sign of resemblance to a chick embryo.
- 18 hours—Appearance of alimentary canal.
- 20 hours—Appearance of vertebral column
- 21 hours—Beginning of formation of nervous system
- 22 hours—Beginning of formation of head
- 23 hours—Appearance of blood islands—vitelline circulation
- 24 hours—Beginning of formation of eye

Second Day:
- 25 hours—Beginning of formation of heart
- 35 hours—Beginning of formation of ear
- 42 hours—Heart begins to beat

Third Day:
- 50 hours—Beginning of formation of amnion
- 60 hours—Beginning of formation of nose
- 62 hours—Beginning of formation of legs
- 64 hours—Beginning of formation of wings
- 70 hours—Beginning of formation of allantois

Fourth Day:
Beginning of formation of tongue

Fifth Day:
Beginning of formation of reproductive organs and differentiation of sex

Sixth Day:
Beginning of formation of beak and eggtooth.

Eight Day:
Beginning of formation of feathers.

10th Day:
Beginning of hardening of beak.

13th Day:
Appearance of scales and claws.

14th Day:
Embryo turns its head toward the blunt end of egg.

16th Day:
Scales, claws, and beak becoming firm and horny.

17th Day:
Beak turns toward air cell.

19th Day:
Yolk sac begins to enter body cavity.

20th Day:
Yolk sac completely drawn into body cavity; embryo occupies practically all the space within the egg except the air cell.

21st Day:
Hatching of chick.
CHICK EMBRYO DEVELOPMENT
POULTRY, LEVEL IV
Member Handout 3, Embryo Development at 5, 10, 15 and 20 Days

Five Days

10 Days

15 Days

20 Days
Chick Coloring to Observe Feather Growth

Poultry, Level IV

What Members Will Learn . . .

ABOUT THE PROJECT:
- To illustrate plumage development
- To demonstrate the rate of growth of feathers in the chick

ABOUT THEMSELVES:
- Their feelings about the first impression they make on others
- The value they place on physical appearance

Materials Needed:
- Fertile chicken eggs—white varieties (White Leghorns, White Plymouth Rocks, White Wyandottes, etc.)
- Incubator
- Egg candler
- Small drill, sharp probe or knife with a good point
- Hypodermic syringe of 1 or 2 cc capacity
- 22-gauge needles, ½-inch long
- Vegetable dyes
- Paraffin, collodion, or cellophane tape
- Tincture of merthiolate or 95 percent alcohol solution
- Member Handout 4, Cross section of 11-day-old Embryo Showing Site of Dye Injection

ACTIVITY TIME NEEDED: 45 MINUTES

Colored chicks are an excellent attraction in any chick display. There are two ways to color chicks: one is by dipping the chicks in a warm dye solution; and the other is the procedure we will use today by injecting dye into the embryo prior to hatching. Coloring chicks is a method which provides an opportunity for you to study early feather growth. Juvenile plumage will replace the colored down in about two weeks. As this happens, the dyed background amid new growing feathers provides a constantly changing pattern.

Procedure:
1. The eggs should be incubated for 15 days.

2. The eggs should be candled, although this is not absolutely essential. If the eggs are not candled and all eggs are injected with the dye, some of the eggs may have been infertile or the embryos may have died at an early age and, thus, will not hatch.
3. Harmless vegetable dyes, such as food coloring dyes sold in grocery stores, work satisfactorily. Red, green, and blue usually give the cleanest and most distinct results. Coloring by injection of these dyes will not adversely affect the chick in any way.

Sterilize the small end of each egg by wiping it with the merthiolate or alcohol solution. Allow eggs to dry. Place the needle on the hypodermic syringe and draw approximately 1 cc of dye solution into the syringe for each egg to be injected. The amount of liquid is not critical as long as ⅛ to 1 cc is used for each egg.

4. Drill a small hole, large enough for the needle on the syringe, in the small or sharper end of the egg shell.

5. Insert the needle into the egg being careful not to stick it into the embryo. Usually ¼ to ½-inch penetration into the egg will be sufficient to go into the extra-embryonic membranes. The tissues of the embryo have developed sufficiently that one will be able to “feel” the needle touch the embryo. If this happens, withdraw the needle slightly before injecting the dye. Inject ½ to 1 cc of the dye solution into the egg.

6. Withdraw the needle, wipe off any leakage which may have come from the egg, and seal the hole with a small amount of paraffin, sealing wax, collodion, or tape.

7. Replace the egg in the incubator. Dye injections can be done at any time between the 12th and 17th day of incubation. Injection can, of course, be done as late as the 17th or 19th day, but greater difficulty of injecting dyes will be encountered.

The injected dye will not affect the growth or development of the embryo. It is not necessary to turn the eggs after 14 days of development.

The chicks will lose this dye color within a few weeks after hatching. All that has been colored is the down and when the normal feathers begin to appear, they will have the normal variety coloring as set by the genetic makeup of the individual.

It may be desirable to brood the chicks for a few weeks where they will not disturb the group, but where observations can be made at regular intervals. It is interesting to note the growth pattern of the feathers on the various sections of the body.

The method described in this lesson is labor intensive and time consuming. Another method of dyeing chicks is to dip them in a warm solution of one part dye and three parts water. Add detergent to the water to improve penetration of the solution. Place the chicks under a source of heat after dipping them in the solution. This method will not hurt the chick or affect its growth or appetite.
DIALOGUE FOR CRITICAL THINKING:
Share:
1. Which method of chick dyeing did you choose? Why?
2. What was the most difficult task when coloring chicks or embryos? Why?

Process:
3. How long do you expect the dye to be noticeable after the chick has hatched? Why? (Discuss feathering sequence.)
4. What was your reaction to temporarily altering the appearance of a chick?

Generalize:
5. What is your opinion about altering or enhancing your appearance? Makeup? Dyeing your hair? Tattoos? Etc.?
6. How does appearance affect first impressions when meeting someone new?

Apply:
7. What effect does a first impression have when interviewing for a job?

GOING FURTHER:
• Demonstrate to other groups how to color baby chicks.
• Have a job recruiter talk to your group about the value of first impressions when interviewing for jobs.

REFERENCES:
Author:
Cynthia R. Siemens, Extension Assistant, Kansas State University; James P. Adams, Extension Specialist, 4-H Youth Programs, Kansas State University

Reviewed by:
Albert W. Adams, Professor Emeritus, Poultry Sciences, Kansas State University; R. Scott Beyer, Extension Specialist, Poultry Sciences, Kansas State University

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CHICK COLORING TO OBSERVE FEATHER GROWTH
POULTRY, LEVEL IV
Member Handout 4, Cross-Section of 11-day-old Embryo Showing the Site of Dye Injection
Chick Coloring to Observe Feather Growth

Poultry, Level IV

What Members Will Learn . . .

ABOUT THE PROJECT:
- To illustrate plumage development
- To demonstrate the rate of growth of feathers in the chick

ABOUT THEMSELVES:
- Their feelings about the first impression they make on others
- The value they place on physical appearance

Materials Needed:
- Fertile chicken eggs—white varieties (White Leghorns, White Plymouth Rocks, White Wyandottes, etc.)
- Incubator
- Egg candler
- Small drill, sharp probe or knife with a good point
- Hypodermic syringe of 1 or 2 cc capacity
- 22-gauge needles, ½-inch long
- Vegetable dyes
- Paraffin, collodion, or cellophane tape
- Tincture of merthiolate or 95 percent alcohol solution
- Member Handout 4, Cross section of 11-day-old Embryo Showing Site of Dye Injection

ACTIVITY TIME NEEDED: 45 MINUTES

ACTIVITY:

Colored chicks are an excellent attraction in any chick display. There are two ways to color chicks: one is by dipping the chicks in a warm dye solution; and the other is the procedure we will use today by injecting dye into the embryo prior to hatching. Coloring chicks is a method which provides an opportunity for you to study early feather growth. Juvenile plumage will replace the colored down in about two weeks. As this happens, the dyed background amid new growing feathers provides a constantly changing pattern.

Procedure:
1. The eggs should be incubated for 15 days.

2. The eggs should be candled, although this is not absolutely essential. If the eggs are not candled and all eggs are injected with the dye, some of the eggs may have been infertile or the embryos may have died at an early age and, thus, will not hatch.
3. Harmless vegetable dyes, such as food coloring dyes sold in grocery stores, work satisfactorily. Red, green, and blue usually give the cleanest and most distinct results. Coloring by injection of these dyes will not adversely affect the chick in any way.

Sterilize the small end of each egg by wiping it with the merthiolate or alcohol solution. Allow eggs to dry. Place the needle on the hypodermic syringe and draw approximately 1 cc of dye solution into the syringe for each egg to be injected. The amount of liquid is not critical as long as ½ to 1 cc is used for each egg.

4. Drill a small hole, large enough for the needle on the syringe, in the small or sharper end of the egg shell.

5. Insert the needle into the egg being careful not to stick it into the embryo. Usually ¼ to ½-inch penetration into the egg will be sufficient to go into the extra-embryonic membranes. The tissues of the embryo have developed sufficiently that one will be able to “feel” the needle touch the embryo. If this happens, withdraw the needle slightly before injecting the dye. Inject ½ to 1 cc of the dye solution into the egg.

6. Withdraw the needle, wipe off any leakage which may have come from the egg, and seal the hole with a small amount of paraffin, sealing wax, collodion, or tape.

7. Replace the egg in the incubator. Dye injections can be done at any time between the 12th and 17th day of incubation. Injection can, of course, be done as late as the 17th or 19th day, but greater difficulty of injecting dyes will be encountered.

The injected dye will not affect the growth or development of the embryo. It is not necessary to turn the eggs after 14 days of development.

The chicks will lose this dye color within a few weeks after hatching. All that has been colored is the down and when the normal feathers begin to appear, they will have the normal variety coloring as set by the genetic makeup of the individual.

It may be desirable to brood the chicks for a few weeks where they will not disturb the group, but where observations can be made at regular intervals. It is interesting to note the growth pattern of the feathers on the various sections of the body.

The method described in this lesson is labor intensive and time consuming. Another method of dyeing chicks is to dip them in a warm solution of one part dye and three parts water. Add detergent to the water to improve penetration of the solution. Place the chicks under a source of heat after dipping them in the solution. This method will not hurt the chick or affect its growth or appetite.
DIALOGUE FOR CRITICAL THINKING:

Share:
1. Which method of chick dyeing did you choose? Why?

2. What was the most difficult task when coloring chicks or embryos? Why?

Process:
3. How long do you expect the dye to be noticeable after the chick has hatched? Why? (Discuss feathering sequence.)

4. What was your reaction to temporarily altering the appearance of a chick?

Generalize:
5. What is your opinion about altering or enhancing your appearance? Makeup? Dyeing your hair? Tattoos? Etc.?

6. How does appearance affect first impressions when meeting someone new?

Apply:
7. What effect does a first impression have when interviewing for a job?

GOING FURTHER:

- Demonstrate to other groups how to color baby chicks.
- Have a job recruiter talk to your group about the value of first impressions when interviewing for jobs.

REFERENCES:

Author:
Cynthia R. Siemens, Extension Assistant, Kansas State University; James P. Adams, Extension Specialist, 4-H Youth Programs, Kansas State University

Reviewed by:
Albert W. Adams, Professor Emeritus, Poultry Sciences, Kansas State University; R. Scott Beyer, Extension Specialist, Poultry Sciences, Kansas State University

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CHICK COLORING TO OBSERVE FEATHER GROWTH
POULTRY, LEVEL IV
Member Handout 4, Cross-Section of 11-day-old Embryo Showing the Site of Dye Injection
Reproductive System of the Hen

Poultry, Level IV

What Members Will Learn . . .

ABOUT THE PROJECT:
• The main parts and functions of a hen’s reproductive tract
• How an egg is formed
• Sections of the reproductive tract in which each part of the egg is formed
• How egg defects occur

ABOUT THEMSELVES:
• Their feelings about dissecting a hen and locating the actual reproductive tract
• The effects of four basic hormones on embryo development

Materials Needed:
• Diagram of a hen’s reproductive tract (from Reproduction and Fertilization of Poultry, Level III)
• Member Handout 5, Procedure for Dissecting a Hen’s Reproductive Tract
• A laying and a nonlaying chicken (at least one hen per four youth)
• Large knife and scissors (for each group)
• Sheet of plastic (for each group)
• Paper towels, sponges, dishpan, etc., for each group of four
• Disposable latex gloves

ACTIVITY TIME NEEDED: 60 MINUTES

ACTIVITY:
The female chicken has special organs for reproduction. She produces sex cells in the form of eggs or ova. During a normal reproductive life of 12 to 14 months, a female chicken may lay 250 to 300 eggs that are formed by the ovary and its associated oviduct. A hen’s egg is large because it contains all the food the developing embryo will need during incubation.

Egg Formation
The hen’s reproductive tract is divided into two distinct sections, the ovary and oviduct. The chicken has two ovaries and oviducts, but only the left ones are functional and produce eggs.

The ovary is a mass of tissue which consists of yolks in varying stages of development. The left ovary is located in the body cavity near the backbone. An ovary contains several thousand yolks that are present at the time the female chick is hatched. When the young female chick (pullet) nears sexual maturity, an increase in secretion of the follicle stimulating...
hormone (FSH) causes immature yolks to start to swell from absorption of yolk material. Each yolk is surrounded by a vascular membrane. A line (stigma or suture) devoid of blood vessels is evident on the membrane. During release (ovulation) of the yolk from the ovary, the sac normally breaks along this line. This prevents blood spot deposits in the egg. The empty sac is absorbed by the bird’s body.

The oviduct is the section which completes the formation of the egg. It consists of five sections. The funnel or infundibulum engulfs the yolk released by the ovary. Fertilization takes place in this section if viable sperm are present. The magnum secretes the thick white of the egg, which takes about three hours. Also, the shape of the egg is formed in this section. The next section, the isthmus, surrounds the white and yolk with two shell membranes. This process takes about 1 1/4 hours. Next, the egg moves into the uterus where it remains for about 20 hours. Here the thin white and the outer hard shell are added. Since the shell is mostly calcium, the demand for calcium is very high during this time. Shell pigments are also added in the uterus. After the egg is completed, it moves to the vagina where it remains until it is laid. It takes from 25 to 27 hours after ovulation to complete formation of an egg. When the egg is laid, it passes into the cloaca, which is the common passageway for the reproductive and digestive tracts.

**Hormonal Influence**

Various stages in the formation of the egg are under the control of hormones that are secreted by the endocrine glands. The action of the hormones are very specific. Many of the malfunctions of the reproductive tract that occur in the hen are the results of malfunctions of one or more of the endocrine glands. The major hormones involved in egg formation are:

1. **Follicle Stimulating Hormone (FSH).** This hormone, which is released by the pituitary gland, is responsible for development of the egg yolks. Secretion of this hormone is under the influence of day length. Increasing day lengths stimulate secretion and decreasing day lengths depress secretion.

2. **Luteinizing Hormone (LH).** This hormone, which is also secreted by the pituitary gland, causes release or ovulation of the egg yolk from the ovary.

3. **Estrogen.** This hormone, which is secreted by the ovary, stimulates the enlargement of the oviduct and spreading of the pubic bones in preparation for egg production. The ovary also secretes the male sex hormone testosterone that causes the pullet’s comb and wattles to enlarge and redden.

4. **Oxytocin.** This hormone, which is secreted by the pituitary, stimulates laying of the completed egg.

**Egg Defects**

Occasionally, malfunctions occur in the reproductive tract of the hen, resulting in defective eggs. Examples are double-yolked eggs, the result of two yolks being ovulated at the same time; yolkless eggs, caused by something stimulating the magnum to secrete thick white followed by the addition of the shell; an egg within an egg, which we think is caused by a
normal egg traveling back up the oviduct and then being covered with egg white and another shell as it proceeds down the tract a second time; eggs with odd shapes or wrinkled shells, the result of a malfunction of the uterus from certain diseases; and a worm in the egg, which is very rare and occurs when a worm leaves the intestine and gets in the oviduct.

**DIALOGUE FOR CRITICAL THINKING:**

**Share:**
1. What were the most difficult and the easiest parts of the dissection procedure? Why?

2. What was different about the actual tract as compared to the diagram?

**Process:**
3. How long does egg formation take?

4. What hormones affect egg formation and what is the function of each? (Note: List these for further review.)

**Generalize:**
5. How does a hen’s egg (ova) differ from a mammal’s ova?

6. What similarities or differences are there in hormones and their functions in hens as compared to mammals?

**Apply:**
6. How will the issues raised by the discussion be useful in the future?

**GOING FURTHER:**
- Using a hen or diagram, show and explain the different parts of the hen’s reproductive tract to your club or class.
- Obtain eggs from as many different species of birds you can and share their differences with your club or class.

**REFERENCES:**
*Poultry Science*, Ensminger
*Poultry Science Manual*, A.W. Adams, Kansas State University
*Formation of the Egg*, 16mm film, Department of Animal Sciences and Industry, Kansas State University
REPRODUCTIVE SYSTEM OF THE HEN
POULTRY, LEVEL IV
Member Handout 5, Procedure for Dissecting a Hen’s Reproductive Tract

Note: Members should wear disposable latex gloves when doing this procedure as a disease prevention strategy. A thorough washing of the hands immediately after the procedure is recommended.

1. Obtain from a local poultry producer a hen in active egg production, and, if possible, a hen that is out of production.

2. Humanely terminate the bird(s) by cervical dislocation. This is done by grasping the head in one hand and the legs in the other. Slowly pull on the head until you can feel the vertebra separate.*

3. After the bird is dead, moisten its feathers in water.

4. Lay the bird on its back on a piece of plastic on a table.

5. Beginning at the vent, make an incision with scissors or knife through the skin running the length of the body over the breast and along the neck to the head region.

6. Make a U-shaped incision through the abdominal wall (ribs).

7. Separate the breast from the carcass at the shoulder joints. The internal organs should now be exposed.

8. Remove the digestive system and heart by severing the digestive system where it enters the body cavity and at the large intestine. Now the ovary and oviduct of the hen should be exposed.

9. Grasp the ovary and cut it away from its attachment to the backbone.

10. Remove the oviduct by severing it where it is attached to the cloaca.

11. Spread the parts on a flat surface.

12. Using a diagram or picture of the hen’s reproductive tract, identify and discuss each section. (Refer to Reproduction and Fertilization of Poultry, Level III.)

13. Compare the lengths of the tracts from the laying and nonlaying hens. Why is there such a difference in size?

* Method of termination is recommended by the American Veterinary Medical Association.
Mounting a Chicken Skeleton for Display

Poultry, Level IV

What Members Will Learn . . .

ABOUT THE PROJECT:
- Nomenclature and function of a chicken’s bones
- To prepare and mount a chicken skeleton for display

ABOUT THEMSELVES:
- Nomenclature and functions of some human bones
- Their feelings about following detailed step by step procedures

Materials Needed:
- A mature chicken (young birds do not have completely calcified bones)
- Sharp knife
- One tube quick-drying cement or glue
- Clear plastic spray
- Small paint brush
- Two feet # 30 aluminum wire
- Three feet #22 wire
- One 16-inch piece of stainless steel wire ½ inch diameter
- One 21-inch piece of ¾ inch diameter stainless steel rod
- Old toothbrush
- Small bottle of chlorine bleach
- A 7 × 12 × 1-inch piece of hardwood for base
- Member Handout 6, The Skeleton of a Fowl
- Small drill

ACTIVITY TIME NEEDED: 3 TO 5 DAYS

ACTIVITY:

Now that you know the major parts of a chicken’s skeleton, preparation of a chicken’s skeleton for mounting will allow you to visualize how your skeleton is put together, how it functions, and special adaptations of a bird’s skeleton for flight.

Procedures for Mounting a Chicken
1. Obtain a mature bird that is several years old.
2. Terminate the bird by severing its jugular vein at the throat or under proper supervision, use an anesthetic (ether, chloroform, or intravenous urethane at the rate of 2 to 3 grams per kilogram of body weight). Be careful the bones are not broken.
3. After the bird has died, remove the skin with the feathers, all viscera (internal organs), comb and wattles. Cut the meat off the breast, thigh, legs, etc. Do not cut or damage the ribs or other bones. Dispose of all parts except the now relatively cleaned carcass.

Leader Notes
This activity will need to be divided up into several parts. Each member should have a bird, but some procedures may need to be done in pairs or small groups.
Caution—Care should be taken to prevent cutting poorly calcified portions of the skeleton. Special care must be taken when cutting in the regions of the head, face and toes.

4. Remove the scales from the metatarsus (shanks and toes).
5. Remove the internal organs and be careful not to break the pubic bones. It is not essential to remove all soft tissue from the skeleton.
6. Fold the legs, wings and neck along the body and tie with a string to make a small compact mass of intact skeleton.
7. Put the carcass in a container and cover it with water. Boil the water for at least two hours. Reduce the heat and allow the carcass to simmer for another four hours. Using a pressure cooker will shorten cooking time. Cool the cooked carcass and strip off any remaining flesh. Then, scrub the bones clean with a toothbrush. Stringing the bones of the neck and tail with wire will keep them in order to make the assembly job easier.
8. After the skeleton has dried at room temperature or baked at 200°F for an hour, the bones can be bleached by placing them in a solution of 1 cup of chlorine bleach in 4 quarts of water for 24 hours.
9. The piece of hardwood and stiff metal rod will be needed to support the skeleton after drying.
10. Split one end of the rod with a fine tooth metal saw and bend the two resultant prongs into a shape of a U or saddle. Now bend the rod so that the saddle will fit around the thoracic vertebrae between ribs number 2 and 3. Carefully bend the rod (do not bend while it is attached to the skeleton) until it will pass in the mid-saggital plane (the plane dividing the bird into right and left halves) just below the thoracic vertebrae, diagonally down to the caudal (rear) tip of the metasternum, then continue the rod ventrally at a slope of approximately 135 degrees. The lower end of the rod will eventually be fixed in the center of the wood base. Until this is done, the rod can be held in a vice.
11. Push a piece of heavy wire as far as possible inside the neural canal of the fused vertebrae of the back, then bend it in an S-shape curve to resemble the natural curve of the neck of the bird. Put the first thoracic vertebra in place, and then put the cervical (neck) vertebrae on the wire and push them into their normal positions with the surfaces overlapping. After the cervical vertebrae are in place, cut the wire so that it will extend 1 inch beyond the vertebrae. Bend the end of the wire so that it will support the skull in a natural position. All cervical vertebrae can be glued. Use a quick-drying airplane glue.
12. The femurs of the legs must be inserted into the sockets of the pelvic girdle (ilium-ischium). Hold them in place with a pin of medium-size wire extending from one femur through the socket cavities to the other femur. Make holes for this pin with a small drill.
13. The bones of the legs can be wired together or glued with quick-drying cement. In some cases the bones may be held in a normal position by the ligaments.
14. After attaching the legs to the pelvic girdle as previously described, you can determine the length of the support rod. Cut the rod to the necessary length to support the skeleton in an upright position and anchor it to the base board.
15. The phalanges (wing tips) can now be straightened and put into normal position. Use small drops of quick-drying cement to hold the digits against the wood base. The bones of the wings can be wired or cemented into position. Usually, the humerus and the radius and ulna are parallel to the scapula and metacarpus. The digits extend ventrally at a 90 degree angle from the forearm. For additional support, use a piece of medium-size wire to thread the wing bones and the vertebrae together.

16. The lower mandible (part of beak) can be cemented or wired at the point of contact with the quadrate (skull). The hypoid apparatus (bone which supports the tongue) can be put in place and cemented or supported by a cemented thread. If the strain is not great, the thread works well and is hardly noticeable. The ocular rings may be suspended in two places by cemented thread.

17. When the skeleton is in its final position, you can retouch many joints with quick-drying cement. Then spray it with clear plastic for preservation or brush it with a thin coat of varnish.

**DIALOGUE FOR CRITICAL THINKING:**

**Share:**
1. As you prepared and assembled the bones, what were some of the surprises you encountered?

2. What were some of the more difficult tasks that you performed? Why?

**Process:**
3. Why is it useful to mount a chicken skeleton?

4. What are some of the unique features of a bird skeleton? Why?

**Generalize:**
5. What other tasks in life require this kind of patience and detail?

6. What are some of the similarities and differences of a chicken’s bones and skeletal structure as compared to those of humans?

**Apply:**
7. What other procedures can be compared to this exercise?

8. How can this detailed step-by-step process help you in everyday life?

**GOING FURTHER:**
- Exhibit your completed project at a local or county fair.
- Prepare and present a demonstration or illustrated talk for your next 4-H club meeting.
REFERENCES:

Author:
Adapted from *Science Studies in Poultry Biology*, G. S. Gieger, retired
Extension Poultry Specialist, University of Missouri; James P. Adams,
Extension Specialist, 4-H Youth Programs, Kansas State University

Reviewed by:
Albert W. Adams, Professor Emeritus, Poultry Sciences, Kansas State
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State University

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Think Back:
What do you remember most after studying a chicken both inside and outside? Why?


37-Poultry, Level IV
Promotion and Marketing of Poultry Products

Poultry, Level IV

What Members Will Learn . . .

ABOUT THE PROJECT:

• Promotion and marketing methods
• What poultry products are marketed to consumers
• Who promotes poultry products
• How to develop a commercial for poultry products

ABOUT THEMSELVES:

• Their ability to be creative and make decisions when promoting themselves for a job
• Their feelings about honesty
• Their interest in promotion and marketing as a career option

Materials Needed:

• Magazine or newspaper advertisements relating to poultry products
• Large sheet of paper or poster board and marking pens
• Several poultry product packages

ACTIVITY TIME NEEDED: 60 MINUTES

ACTIVITY:

What are some reasons why you buy a certain product? How do you learn about new products? What are some products that are advertised to the public? How are products promoted to the public?

Type of Advertising

Promotion and advertising of products is found all around us in a variety of media. From a simple newspaper advertisement to a major television commercial, advertisements can be seen every second of every day. The promotion of a product may be directed in one or several directions: “It’s good for you,” “It will make you popular,” “It will make you beautiful,” “It will save you money,” etc.

Some other places that you might find products promoted would be a trade show, store display, and fair exhibit booth, to name a few.

Besides advertisements, products are also promoted through the packaging of the product itself. Products are usually sold or displayed in attractive, eye-catching packaging. What kind of packaging do you find poultry products in? What information would you want to see on the package?

Who Promotes Products?

A product is not usually marketed by one single person or business. Product advertisement and promotion is handled by a variety of

Leader Notes

List sponsors of the various product promotions.

Divide members into groups of two or three. Ask them these questions and write their answers on a large sheet of paper.

Look through magazines and newspapers. Have members share an advertisement with the group and point out the main selling point of that advertisement.

Have members look at packages and list the types of information that is provided.
individuals and organizations. There may be poultry producers, poultry producer organizations, poultry product manufacturers, retail stores, etc. If you look through a magazine or newspaper, identify who is funding the product promotion.

Related Activities
1. Make a poster or scrapbook of poultry advertisements and promotion pieces.
2. Develop a commercial or advertisement for poultry products. Divide your members into groups of two or three. Have each group select a poultry product to advertise. Have members write their own script and present it to the group.
3. Take a tour of a grocery store and look specifically at the merchandising of poultry products. Take note of where the items are located, how they are packaged, what information appears on the label, special promotion displays, etc. Make a list of all poultry products sold.

DIALOGUE FOR CRITICAL THINKING:
Share:
1. What was the main selling point of most poultry product advertising?
2. What do you remember most about the packages of poultry products?

Process:
3. How do most people learn about new products?
4. How are most products promoted to the public?
5. Who promotes most products? Why?

Generalize:
6. What did you learn from making your own commercial?
7. What role does honesty have in advertising?

Apply:
8. How does making a commercial compare with interviewing and applying for a job?
9. What would you do differently if you studied marketing and promotion again? Why?
GOING FURTHER:
• Contact the Kansas Poultry Association, c/o Dr. Scott Beyer, Extension Specialist, Poultry Sciences, 225 Call Hall, Manhattan, Kansas 66506-0202.
• Visit with an advertising agency to see what guidelines they follow in designing advertisements.
• Develop a promotional exhibit to be displayed with the poultry exhibits at the county fair.

REFERENCES:
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Cynthia R. Siemens, Extension Assistant, Kansas State University; James P. Adams, Extension Specialist, 4-H Youth Programs, Kansas State University

Reviewed by:
Albert W. Adams, Professor Emeritus, Poultry Sciences, Kansas State University; R. Scott Beyer, Extension Specialist, Poultry Sciences, Kansas State University
Poultry Welfare Issue

Poultry, Level IV

What Members Will Learn . .

ABOUT THE PROJECT:
• Definitions of five poultry welfare terms
• The advantages and disadvantages of modern poultry production practices
• How to respond to animal activists’ inquiries

ABOUT THEMSELVES:
• Their feelings about their basic human rights
• What forms the basis for their moral position
• The importance of teamwork to solve a problem or develop a program

Materials Needed:
• Member Handout 7, Animal Relationship Patterns
• Activity Sheet 1, Media Quiz
• Member Handout 8, Egg Producers Husbandry Practices

ACTIVITY TIME NEEDED: 45 MINUTES

ACTIVITY:

The chicken’s environment has changed dramatically during this century. Prior to World War II, most farms had a small flock that was kept in a house with roosts, nests, litter to scratch in, and access to outdoor areas in moderate weather. People concerned about the welfare of poultry believe this type of environment is adequate because it is similar to the natural environment of the wild chicken. But the life of a chicken running loose in the wild or outdoor run still faces the dangers of predators, severe weather and disease.

Most recently, the hen’s lifestyle and environment have been altered in major ways. Artificial incubation and brooding have replaced the hen, and broody behavior is rarely seen because broody hens don’t lay eggs.

Flocks have become fewer but larger in response to increasing housing and equipment costs. This trend has resulted in total confinement, reduced living space per bird, and automatic feeding, watering, egg collection and manure removal. These features have led to the term factory farming or industrialization, which is frequently used as a criticism of modern poultry production practices.

The final step in this trend was the adoption of cages for hens because the number of birds in a house could be increased by stacking rows of cages.
above each other. As the living space per hen was reduced, problems such as cage fatigue, cannibalism, excessive feather loss, flightiness, and reduced productivity appeared. To reduce these problems, the poultry industry has adopted such practices as beak trimming, declawing, and low light intensities. These problems and the management practices that have been adopted to reduce them have caused people to raise questions about the welfare of birds kept under these conditions.

What do we mean by animal welfare? Generally, it’s the treatment we give to, or impose upon the animals we use. A more positive approach is to replace the word welfare with health and well-being. Causes of suffering in poultry can be divided into three main forms: abuse, which expresses itself as fear, injury, pain and distress; neglect, through ignorance or overwork such as malnutrition, disease or distress; and deprivation, resulting in changes in normal behavior of the bird.

Who is concerned about animal welfare? Concern about animal welfare is shared by people from diverse backgrounds. Farmers and ranchers consider animal welfare as part of animal husbandry. The provision for basic needs of the animal such as food, water and shelter are considered to enhance the well being of the animal. Most of these basic needs are important to productivity, too. Other persons will add animal needs such as dustbathing that may or may not influence productivity. This expanded vision of animal welfare is currently in debate by scientists, farmers and ranchers, and animal protection advocates.

There are a variety of views of the roles of animals in society and their relationship to humans. Listed below are examples of the different attitudes developed toward animals.

**Animal exploitationists** believe that animals were put on earth for man’s use or abuse. They believe the ends justify the means.

**Animal controllists** believe man is here to enforce the laws relative to animal control, such as neutering and humane destruction of surplus animals. It’s not their fault people treat animals irresponsibly.

**Animal welfarists** believe that people should treat animals as kindly as possible. Animal welfare advocates want to improve methods of animal husbandry. They also believe in such practices as neutering and humane destruction of surplus animals. There are more conservative expressions of animal welfare in which welfare is considered as meeting basic needs and more radical expressions where needs unrelated to productivity are demanded to be met.

**Animal rightists** believe that animals have rights similar to humans. They typically oppose all use of animals for food, clothing, sport and research. This is a vegetarian ideology, proponents of which want to eliminate livestock production altogether.
Animal liberationists believe that animals should not be forced to work or produce in any way for the benefit of man. They believe animals should not be viewed as a resource.

What should be the poultry industry’s response to animal activists or to media representatives looking for a story?

First, know who the organizations or individuals are and what view they represent.

Second, recognize what they are saying. Most likely this will require you to study information about the organization and its human attitudes toward animals.

Third, get involved by studying the issues. What are the real issues society is concerned about? Why are they concerned? What laws does your state have that pertain to animal well-being?

Fourth, be prepared to respond to these issues in a factual and calm manner. What are the advantages of the modern poultry industry to society? Why is the modern chicken better off than its wild ancestors? How do such husbandry practices as beak trimming improve the welfare of chickens? How can you tell when chickens are receiving proper care?

The modern poultry industry is concerned about the well-being of its birds and have developed husbandry guidelines for the industry such as The United Egg Producers Husbandry Practices for Laying Chickens. The industry knows that good husbandry practices result in good productivity.

DIALOGUE FOR CRITICAL THINKING:
Share:
1. How did you feel about discussing the poultry welfare issue?
2. How would you feel if you were asked to represent a view you did not agree with?
3. What specific issue did you discuss most? Why?

Process:
4. What personal experiences have you had with the animal welfare issue?
5. What position or pattern do you most closely agree with?

Generalize:
6. What are the public concern issues that have increased the interest in animal welfare? Why has it become an issue?
7. What did you learn about yourself as you discussed the issues in this lesson?
Apply:
8. What need do you see for this lesson in the future as compared to now and in the past? Why?

9. How will you act differently in the future as a result of this lesson?

GOING FURTHER:
• Make a presentation to your club about one of the major animal rights organizations.
• Make a presentation on husbandry practices used by the poultry industry to improve the well-being of the birds.
• Tour a modern egg production or turkey production facility to view husbandry practices.

REFERENCES:
Animal Welfare Information Center, National Agricultural Library, Beltsville, MD 20705, (301) 344-3704
Local Farm Bureau

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### An Overview of Animal-Related Organizations, With Some Guidelines for Recognizing Patterns

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<td>“Animals were put here for our use or abuse. They are our absolute property. They probably don’t perceive pain as we do, and even if they could, it doesn’t matter.”</td>
<td>“Animals are here for our use, but we must be responsible about them (at least until we think our needs are more important). We should attempt to spare them pain and suffering, if possible.”</td>
<td>“We’re here to enforce the laws, ordinances, and regulations agreed to by our lawmakers. No more, no less. It’s not our fault people are irresponsible.”</td>
<td>“People should treat each animal as kindly as possible; they should be required to do so. If they can’t or won’t, we have a duty to look after the suffering or homeless.”</td>
<td>“Animals have intrinsic rights; these should be guaranteed just as ours are. These rights include not being killed, eaten, used for sport or research, or abused in any way.”</td>
<td>“Animals should not be forced to work or produce for our benefit in any way. We should try to eliminate all types of animal use, as well as abuse.”</td>
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<td>Groups advocating or conducting activities that are illegal (for the most part) in this country. Most of these were not prohibited in the past and may not now in other countries and cultures. Most involve the pain or death of animals just for the fun of the spectators: bullfighting, dog fighting, cockfighting (legal in some states), live pigeon target shooting, killing or injuring horses, etc., for the movies or TV. “sports” which pit animals of some kind against another kind. Breed carefully for contests. Eventual suffering of animal unimportant. Breed just to make money.</td>
<td>To ensure minimal animal abuse, and to be fair, all groups have rules by which their sports or hobbies are conducted. Some are regulated by law. The trend is for rules to become more stringent and for them to be more censure for those people not abiding by them. <strong>The line between abuse and use exists in the mind of the classifier as well as within the legalities and rules of the industry or sport.</strong> Groups promote: hunting, trapping, fishing, rodeos, exotic animal keeping, horse and dog sports, various other kinds of animal events, pure breeds of dogs, cats, horses, livestock, etc.</td>
<td>Municipal and county animal control agencies state and federal wildlife, livestock, disease control, and other regulatory agencies. The USDA (enforcement agent for the federal Animal Welfare Act), state, regional and national animal control organizations and federations. Usually have trouble getting the existing regulations obeyed. In favor of more regulation, if sensible, and funds provided for enforcement. Beset by pro- and anti-regulation individuals and pressure groups.</td>
<td>National groups working for all animals, or specific species or issues. State and regional federations or humane societies. Independent local humane societies, SPCAs, animal welfare leagues, etc., dog breed rescue groups. Those with shelters cannot be too far ahead of local value systems as they are dependent on the public for operating funds. Hunters, rodeo fans and women with fur coats are often valuable supporters of pet animal welfare.</td>
<td>National and local animal rights groups. Anti-vivisection societies. Private, non-profit, non-euthanizing organizations, with or w/out shelters. Home-based “save-a-life” rescue schemes and animal old age homes. Any local or national group devoted to saving something they will not consider killing under any circumstance.</td>
<td>National and local animal rights groups. Anti-vivisection societies. Private, non-profit, non-euthanizing organizations, with or w/out shelters. Home-based “save-a-life” rescue schemes and animal old age homes. Any local or national group devoted to saving something they will not consider killing under any circumstance.</td>
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<td>Local animal control agencies may choose to adopt many or all of the principles used by animal welfare shelters and programs. May provide animals for research. Veterinary organizations. More and more advocating or encouraging/requiring spay/neuter.</td>
<td>Local animal welfare agencies may contract governments to conduct animal control programs and/or house impounded animals. Usually have more stringent adoption requirements and may keep animals longer.</td>
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<td>Wildlife “conserve-so-can harvest” groups. Required to destroy surplus animals.</td>
<td>Will not provide animals for research. Require spay/neuter. Believe that as there are too many pet animals, almost no one should have the right to breed them.</td>
<td>Wildlife “save-no-matter-what” groups. Divided between regulationists willing to work for the regulation of activities such as rodeo, research, etc, and abolitionists calling for their total ban.</td>
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Depending on each individual’s sensitivities and priorities, members do not hunt or patronize sports or entertainments involving animals, and are willing to forgo furs, meat, eggs, milk products, leather, the results of medical research or production involving animals, e.g. vaccines, most cosmetics, etc.
**POULTRY WELFARE ISSUE**

**POULTRY, LEVEL IV**

**Member Handout 7, Animal Relationship Patterns, continued**

An Overview of Animal-Related Organizations, With Some Guidelines for Recognizing Patterns

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<td>“The ends justify the means. We have a right to have fun and do whatever we want with and to animals even if it means breaking the rules or the law.”</td>
<td>The increasingly vocal antidog organizations.</td>
<td>Work within the existing laws and systems to accomplish goals. Publicize and document animal abuses and needs to raise public and official consciousness to get changes made.</td>
<td>Willing to euthanize surplus pets rather than let them suffer.</td>
<td>Some would say pet animals have a right to breed. Most would require spay/neuter.</td>
<td>Some won’t keep pets at all, considering it a form of enslavement.</td>
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<td>At best, hobby and sport breeders breed carefully for best genetic and health potential, cull, socialize, choose responsible owners and will take back offspring if home doesn’t work out. At worst, breed just for glory or to support expensive hobby. Advocate the killing or harvesting of animals, birds, fish, etc., for food or other uses. Killing should be as swift and painless as possible. Less likely to want present laws increased or strengthened. May have fought any regulation at all. Insist they can police their own houses.</td>
<td></td>
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<td>Unwilling to sanction any taking of life. This may have philosophical and/or empathetic origins.</td>
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<td>“The ends do not justify the means. The very basis of our system of government is the premise that, no matter what the issue, people can not just take the law into their own hands. There are means available to redress wrongs and to initiate and change rules, regulations and enforcement levels.”</td>
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<td>May believe the law is for the other fellow. May include self-styled anti-cruelty investigators and individuals who rescue strays and cruelty cases without benefit of due process.</td>
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<td>In order to save the animals involved and to bring their plight to public attention, may advocate civil disobedience, confrontation, harassment, and the illegal removal of experimental pound, or other animals considered to be suffering or likely to be destroyed.</td>
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<td>“The ends justify the means. Our cause of ending animal suffering is so just that we have the right to break the law.”</td>
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The space allocated to each category does not reflect either the number of organizations of each type or the number of people who would agree with the values described. It is not possible to depict here the graduations of ethical values within organizations any more than it is easy to categorize one’s own attitudes toward animals commonly regarded as being vermin, prey, dangerous, endangered, useful, loyal, edible, cute, old, pet, etc, etc.
POULTRY WELFARE ISSUE
POULTRY, LEVEL IV
Activity Sheet 1, Media Quiz

1. The media has an important role in developing public policy. ___T___F
2. Public understanding of animal welfare is increased through media coverage. ___T___F
3. Good media relations can be achieved through consistent contacts with the news media. ___T___F
4. It is always best to wait a few minutes before doing an interview with a reporter. ___T___F
5. It is always best to let the reporter select the place for the interview. ___T___F
6. In order to feel comfortable, ask the reporter for a list of questions in advance. ___T___F
7. Questions asked off the record should rarely be used. ___T___F
8. Always make sure to find out when the article will run and how long it will be. ___T___F
9. Radio interviews should not be conducted over the telephone. ___T___F
10. Always call and make an appointment before dropping by to see the editor. ___T___F
11. In order to communicate effectively with a television audience, the person being interviewed should look at the camera. ___T___F
12. A good public speaking voice is necessary for a broadcast interview. ___T___F
13. It is always good to prepare a short standard message for broadcast interviews. ___T___F
14. Being armed with plenty of facts is important in the preparation for an interview. ___T___F
15. Hypothetical questions should be avoided. ___T___F
Herein subscribes to the following practices outlined in the United Egg Producers Recommended Guidelines of Husbandry Practices for Laying Chickens.

- **To provide** the housing and equipment necessary to protect the health and welfare of my flocks.

- **To provide** the necessary sanitation, vaccination, and medication programs to protect the health of my flock from disease, infection and poultry illness. No drugs are used to stimulate growth.

- **To maintain** all feed, water, light, ventilation and standby equipment in good operational condition.

- **To provide** cages that have adequate space and take into consideration the welfare of my flock.

- **To give** due consideration to the welfare of the flock when making husbandry decisions.

- **To use** humane methods when it becomes necessary to dispose of any bird.

- **To schedule** a daily inspection of all birds on my farm.

- **To make** all personnel knowledgeable of those factors that can cause discomfort to pullets and hens.

- **To follow**, to the best of my ability, the recommendations set forth in the Guidelines of Husbandry Practices for Laying Chickens.

___________________________________________________________

(authorized firm signature)
What Members Will Learn . . .

ABOUT THE PROJECT:
- Ten possible poultry careers
- Salary ranges for poultry careers
- Educational requirements for poultry careers

ABOUT THEMSELVES:
- Their likes and dislikes about the poultry industry
- Their ability to discuss major factors in making career choices
- Their feelings and interest in education as it reflects on career choices

Materials Needed:
- Notebook and pencil
- First page of Member Guide and Annual Report (at the end of the Introduction)

ACTIVITY TIME NEEDED: DEPENDS ON INTEREST

ACTIVITY:
A few years ago, the poultry business was considered a weak moneymaking enterprise. However, since the increase in demand for poultry meat, the poultry industry has become a very successful enterprise.

The following aspects of the poultry industry should be considered before studying specific careers:
1. The scope of the industry in your area and state
2. The importance of poultry in the United States as opposed to other countries
3. The production phases or segments of the industry:
   a) Hatcheries
   b) Fryers
   c) Broilers
   d) Pullet growing
   e) Layer operations
   f) Egg industry
   g) Roasters
   h) Turkeys
   i) Ducks and geese

Consider some of the following methods to help you analyze possible poultry careers:
1. Invite a poultry specialist, career counselor or other resource person to visit your group.

Leader Notes
Learning about careers in the poultry industry could be a single visit or a whole series of activities depending on your members’ interest.

Refer to front page of the Member Guide and Annual Report for additional careers.

Remind members to complete step 8 in their Member Guide after this lesson. Reflect and record some of the highlights of all the years in the poultry project.
2. View movies, slide sets or videos on poultry careers.
3. Visit segments of the industry in your area.
4. Invite poultry company representatives to your meetings.
5. Invite a poultry feed company or pharmaceutical company representative to your meeting.
6. Do a computer job or career search in your local library.
7. Study consumer and food safety related jobs.
8. Ask someone from a government agency to discuss state, national and international opportunities.
9. Study opportunities for research and teaching.
10. Have a discussion with other members about their career plans and what their goals are for the next 5 to 10 years.

DIALOGUE FOR CRITICAL THINKING:
Share:
1. How many poultry careers do you know about? (List and discuss.)
2. What was the most interesting aspect of all the poultry careers you studied? Why?

Process:
3. What were some of the pros and cons of various poultry careers?
4. What decisions must you make to prepare for most poultry careers?

Generalize:
5. What did you learn about yourself through this activity?
6. How could this career study process help you in related fields or other career options?

Apply:
7. What educational requirements are needed for most careers? Why?
8. If you were to study other career possibilities, what would you do differently? Why?

GOING FURTHER:
• Write to the USDA and other poultry agencies, such as the Poultry Science Association, for more information.
• Give presentations to other groups about the opportunities in the poultry industry.
REFERENCES:

Videos:
Consider a Career in Poultry Science, (Youth) and Poultry Science: A Dynamic Career Choice, (Leaders); Kansas Poultry Association, 130 Call Hall, Manhattan, Kansas, 66506-1600

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