

# Union County 4H

## Raising Pullets

### Handbook



#### **150CEP Chicken, Egg Production: Pullets and Hens**

At the Union County Fair the Pullet project consists of a pen of 3 birds. All 3 birds are shown together as a group. Pullets are defined as females under one year of age. Hens are classified as females over one year of age. NPIP papers must be valid at the time of the fair or you must get your birds tested prior to the fair. Testing is available at the fairgrounds. Time and date will be announced.

# Which Came First— The Chicken or the Egg?

It really doesn't matter, because you can learn and have fun with the 4-H Poultry Project studying either the chicken or the egg.

## Purpose

- Learn how to brood, feed, and care for chickens.
- Learn responsibility by having a flock of your own.
- Develop business ability by having a business enterprise of your own.
- Learn how to keep and use records.
- Learn interesting things about poultry.

## Advantages

- Ohio's climate is favorable for poultry production.
- Poultry are easier to handle than larger animals.
- Only a small area is required.
- You will gain valuable knowledge of poultry production, which will be helpful if you decide to become a commercial poultry producer.
- There is a very large poultry industry in Ohio and the United States that is always looking for knowledgeable individuals to employ.
- You can help provide food for your family or you can sell eggs and/or birds for income.

## Choosing a project

- Identify your objective. Do you want: To have fun? To add to the family food supply? To make money? To explore a career? To have something different for show? To help keep a breed from becoming extinct?
- Determine the space and equipment needed.
- How much money can you invest?
- What are the city and county ordinances where you live? Are there any restrictions?

## **Poultry Production Option**

### **Selecting your project birds**

- Day-old chicks are much less of a disease risk than “older” chicks.
- Buy from a reliable source.
- Because you may want only several birds, go to a hatchery to pick them up or order or purchase them at a retail store. You may also purchase grown birds from breeders or poultry shows as long as you do so before May 1<sup>st</sup>.
- A list of approved hatcheries is available from the Ohio Department of Agriculture. When purchasing chicks, purchase only from producers who participate in the National Poultry Improvement Plan (NPIP). This is a U.S. Department of Agriculture (USDA) program in which all breeders from NPIP flocks are tested for some of the important diseases of poultry. This assures you that the chicks you receive are not infected with diseases.

### **Chickens**

- Family flock project for eggs and/or meat at home. Start with 15 or more chicks and/or 6 or more layers.
- An income-producing flock for home supply and limited sales. Start with 20 layers.
- Fancy breeds, either large fowl or bantams, can be an interesting hobby or study. Start with a pair or trio of adult birds, or 10 or more chicks.

## **Breeds**

As a 4-H poultry club member, you have a wide selection of breeds and varieties of poultry from which to choose. There are more than 100 different breeds of poultry, including chickens (large and bantam), ducks, geese, and turkeys, and more than 400 different varieties.

The popularity of bantams has increased tremendously in recent years. Many poultry shows have as many or more bantams than large birds. Bantams are simply small chickens. Some are miniatures of large poultry breeds, while others are found only as bantams and are of a type and color not seen in large chickens. When there are large fowl counterparts, the bantams are about one-fourth to one-fifth the size of the large fowl. Many people who cannot keep large poultry raise bantams, while others simply enjoy raising bantams.

The following lists describe the more common breeds that 4-H poultry project members are likely to encounter and show at county and state fairs. Many of the rare breeds of poultry, whether large fowl or bantam, typically are more difficult to raise. Also, because of the rarity of some of these breeds, they have been inbred to the point where their livability is poor—they lay fewer and smaller eggs, and the fertility and hatchability of their eggs is less than the more common breeds and varieties.

**New Hampshire.** This breed was gradually developed beginning around 1915 from a foundation of Rhode Island Reds. In the past, they have been a very popular, general-purpose utility fowl for egg and meat production. Skin color is yellow, and eggs are brown.

**Plymouth Rock.** The best-known Plymouth Rocks are the White Plymouth Rocks and the Barred Plymouth Rocks. They are dual-purpose breeds that were developed for the production of both meat and eggs. Skin color is yellow, and eggs are brown.

**Rhode Island Red.** The distinct shape characteristic of the Rhode Island Red breed is the horizontal oblong body. This general-purpose breed is bred for the production of meat and eggs. The color of the skin is yellow. The eggshell color varies from brown to dark brown.

**White Leghorn.** The single-comb White Leghorn has been the foundation of the commercial egg industry in America. This breed is characterized by great activity, hardiness, and prolific egg-laying qualities. This breed has yellow skin and lays white-shelled eggs.

**Cornish.** The Cornish breed originated in Cornwall, England. A distinguishing characteristic is that both the male and female body are the same conformation. Both the Dark Cornish and White Cornish are super-heavy meat-producing birds and are valuable for crossing with other breeds for the production of market poultry. The skin is yellow, and eggshells are brown.

**Cornish Cross.** Although this is not a true breed, it is one of the most common poultry types found in small flocks where chickens are raised for meat production. The bird is a cross started in the 1930s by a breeder in California. The cross was probably the Cornish because of its body type, the New Hampshire for its body size, and the White Plymouth Rock for its white feathers.

Additional chicken breeds can be found in the Standard of Perfection

### **Getting Started**

#### Preparation and Brooding

The term *brooding* refers to the period immediately after hatch when special care and attention must be given to chicks to ensure health and survival.

The term *rearing* refers to the remainder of life after brooding until maturity.

Handling of day-old chicks has a direct relationship on the life-time production of the bird. Effective management begins before the day-olds arrive.

The three factors to control are environment, feed and water.

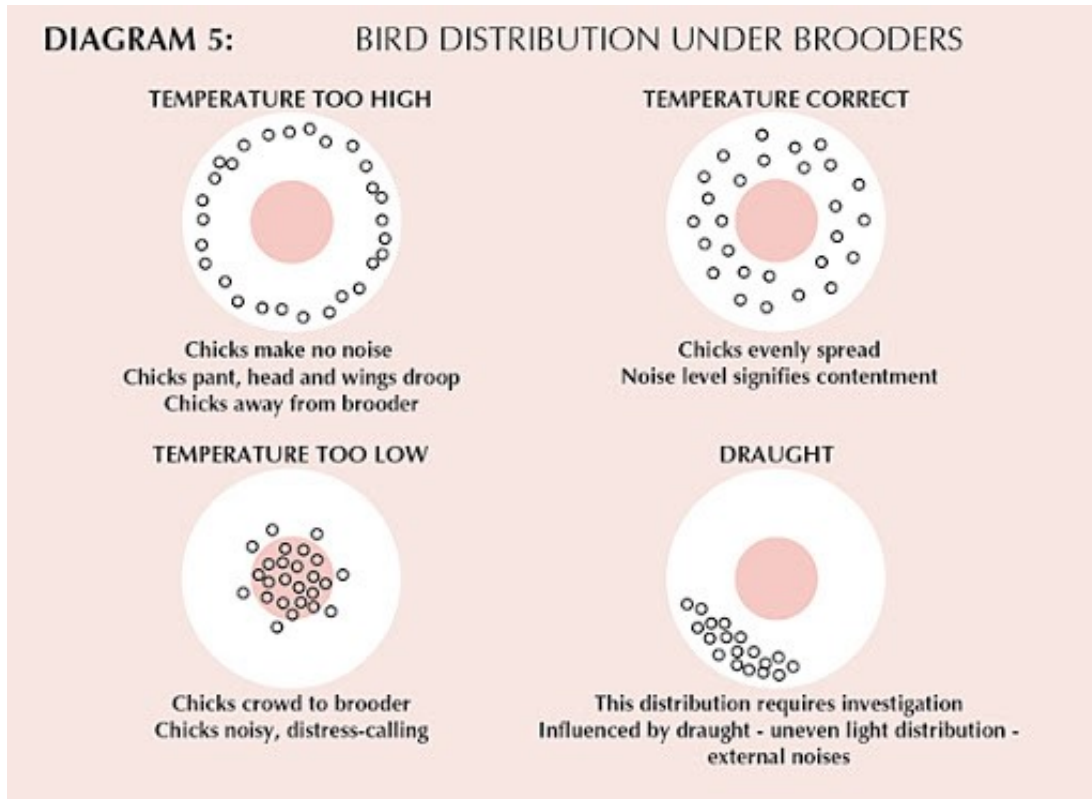
## Environment

- Brooding houses should be isolated from other houses containing older birds. The producer should follow an “all-in, all-out” program, never mixing birds of different ages.
- Brooders must be set up in a draft-free environment.
- Heat lamps must be checked to ensure that they are working properly before the arrival of the chicks. This is a routine check to be carried out daily.
- Ventilation should be adequate to remove undesirable gases such as ammonia and provide clean air but not so much to remove heat or create drafts.
- The brooding area should be heated to 95-98° before the arrival of the chicks. Be careful to always check the temperature at the level of the chicks.
- A hatched chick cannot maintain a proper body temperature without your help. Exposing a chick to cool temperatures in the first three weeks of life makes the bird uncomfortable and less likely to eat the feed and drink the water needed for a good start. In meat-type chickens, cool temperatures can lead to permanent heart damage. Exposing the young bird to cool (70°F) for the first day or two on the farm can cause the bird to die from heart problems later. Heated premises are definitely needed for brooding.
- Turn the heat on at least one day before the birds arrive on the farm. The temperature ½ " below the litter surface should be at least 80°F. Even if the air is the correct temperature, the birds can be chilled by the cold floor under them.
- Pine shavings are the ideal bedding choice for brooding and rearing your poultry. Meat birds need at least 1" of clean fresh bedding for each week of age. A 3-week-old bird should be on 3" of bedding.
- Bedding is used to conserve heat and must be leveled and compacted to prevent chick crowding.
- Bedding should not contain too much dust as it can cause your birds to have breathing problems.
- Cedar and hard-Wood chips should not be used as it will stain your birds.
- It is important to keep your bedding clean and dry at all times. Dirty bedding can cause health problems for your birds.
- Always remove any wet or caked bedding and replace it with dry shavings.
- The following chart shows the average temperatures for brooding chicks as they mature week by week.

Age of Chicks (weeks)	Temperature
1	95°
2	90°
3	85°
4	80°
5	75°
6	70°

### Judging Bird Comfort

- The behavior and sounds of the chicks will indicate their comfort level. Comfortable birds will form a circle under the lamp, and make soft "cheeping" noises; cold birds will huddle and pile, and make sharp noises. If birds are too hot, they will crowd as far from the lamps as possible. Some birds will pant if the temperature is too high. Your birds will do a better job than a thermometer of telling you if they are comfortable. The diagrams below show how birds will move away or towards the heat lamp if they are hot or cold.



### **Brooding Guide**

<b>Age</b>	<b>Floor Space</b>	<b>Feeder Space</b>	<b>Waterer Space</b>	<b>Ventilation room temp.</b>	<b>Management Practices</b>
<b>1<sup>st</sup> week</b>	<b>1 sq ft per chick</b>	<b>1 linear inch per chick</b>	<b>Two 1-gallon waterers per 100 chicks</b>	<b>Keep air fresh. Ventilate moderately. 70-100 degrees F</b>	<b>Place waterers near edge of brooder. Dip beaks in water when placed in brooder. Sprinkle feed on paper towels for 1<sup>st</sup> day. Fill feeders full.</b>
<b>2-6 weeks</b>	<b>Same</b>	<b>2 linear inches per chick</b>	<b>Two 3-gallon waterers per 100 chicks</b>	<b>Increase ventilation to keep room cool and chicks comfortable. 70-90 degrees F</b>	<b>Keep area around waterers dry</b>
<b>6-8 weeks</b>	<b>Same</b>	<b>3 linear inches per chick</b>	<b>Two 5-gallon waterers per 100 chicks</b>	<b>Same 70-80 degrees F</b>	<b>Keep bedding dry. Remove wet areas and replace with dry.</b>

## **Feed and Water**

- Fresh food and water should be available on arrival of the day-old chicks.
- Use chick waterers, not open trays and do not place them directly under the light source.
- Fresh water should be available at all times. The waterers need to be cleaned on a routine basis.
- It is helpful to dip the chick's beaks into the water when you first place them into the brooder ring.
- Feed should be provided continuously. Never restrict feed during the brooding stage of chick development.
- Water is the most important nutrient you can provide for your birds. If the water is not clean, your birds may not drink enough thus limiting their feed intake and their growth rate.

## **Guidelines for Feeding Your Pullets**

### **Proteins**

- Protein is a nutrient that must be present in adequate amounts in poultry food.
- Proteins are broken down into amino acids during the digestive process.
- Amino acids are classified as "essential" or "nonessential."
- The "essential" amino acids are those that cannot be produced in sufficient quantity in digestion to meet a bird's nutritive requirements. They must be supplied in the diet.
- Since most protein sources individually will not supply all essential amino acids, it is common to use combinations of materials containing protein.
- Common protein sources include meat meal, fishmeal, soybean meal, alfalfa meal, and corn gluten meal.
- All feed manufacturers are required to list the percentage of protein contained in their feed on a tag attached to the bag.
- Always check the feed you buy to ensure it has the required protein content.
- The amount of protein required in the ration varies by species, and in some cases, changes as the birds grow.
- Protein requirements need to be higher when your chicks start out and will decrease as they mature.
- Broiler rations are higher in protein than they are for fancy poultry due to their quick rate of growth.
- Begin feeding your day-old chicks a balanced Chick Starter Ration.
- Starter feed is usually between 18-20% protein.
- The starter helps build a strong skeletal system and the grower-finisher helps put the meat on the bird.
- At 8 weeks of age you can switch your flock over to a grower if you wish or continue the starter until the birds start to lay eggs.



- Once the birds begin laying eggs change to a layer pellet or crumble. Layer rations are typically about 16% protein and contain extra calcium for strong eggshells.

### **Carbohydrates and Fats**

- Both carbohydrates and fats serve as sources of energy for the birds.
- Most grains supply carbohydrates in large amounts but do not contain enough protein, minerals, or vitamins in amounts or quality to produce strong, vigorous birds.
- Carbohydrates also are found in other ingredients of vegetable origin, such as soybean meal. The most common carbohydrate source in typical poultry diets is corn.
- Fats are found in limited amounts in grains, and to a greater extent in some other feedstuffs such as meat or fish meals as well as in pure form.
- Usually, when fats must be added to poultry diets they are added as either vegetable oils or tallow (rendered animal fat).

### **Minerals**

- Minerals are essential inorganic elements, and unless provided in sufficient supply, both egg production and hatchability may drop.
- Grains, their by-products, and other vegetable feed stuffs are low in minerals and must be supplemented with ingredients of higher mineral content. In nearly all poultry diets, a trace mineral premix is added to meet the birds' mineral requirements.
- Crushed Oyster shells can also be provided for chickens that are old enough to lay eggs. This adds calcium to the pullet's diet.
- Extra calcium should not be given to young birds that are not yet laying eggs because it can cause bone or kidney problems.

### **Vitamins**

- Vitamins are required in small amounts for normal health, growth, and reproduction.
- Vitamins essential for viability and growth of chicks include among others Vitamins A, B12, D, riboflavin, and pantothenic acid. As with minerals, a vitamin premix is added to nearly all poultry diets to meet basic needs.

### **Rations**

- Commercially mixed feeds usually are the best way to make sure poultry receive a proper balanced diet. Because chicken requirements change with age and productive status, feed names typically reflect the age and production level of the birds. For example, young chicks from hatch to about 6 weeks of age should receive "starter" feeds.
- Birds being raised for meat should be fed a diet that is specifically formulated for meat birds. Scratch is not a balanced feed. Because it usually is cracked corn and wheat, consider it a supplement.
- The majority of chicken feed on a daily basis must be a prepared ration.

- Today, almost all feed is available in crumble or pellet form. This is the ground feed (formerly called mash) that is formed into a pellet, and sometimes crushed into a crumble.
- It is not advisable, and usually not successful, for 4-H members to mix their own feed. Poultry require additional sources of grains and protein because their diets require vitamin and trace mineral premixes. You also must own a grinder and mixer to mix your own feed. If you wish to mix your own poultry rations, visit with your local Extension faculty or the OSU Department of Animal Sciences.

### **Medicated feeds**

- Most starter feeds have a coccidiostat added to the poultry ration to prevent coccidiosis.
- This additive adds little to the cost when you consider the amount of protection it provides.
- Medicated feeds are developed for young chicks, so keep adult chickens away from these feeds. Also, do not give medicated feeds to laying chickens.
- Some companies mix non-medicated feeds. If you choose these feeds, you can expect a higher mortality (death rate) in your flock.
- Always follow the manufacturer's recommendations for proper use of medicated feeds.

**Hens of laying age need 16 hours of daylight in order to produce eggs.**

### **Diseases**

- It is better to prevent rather than try to cure poultry diseases.
- You can prevent nearly all poultry diseases by following a strict sanitation, feeding, and management program.
- Always remove sick birds from the flock and give them special attention or kill them. If you suspect a disease outbreak, check with a local veterinarian.

### **Common poultry diseases**

- Coccidiosis is a protozoal disease that is extremely common in young poultry. To prevent this disease, provide your flocks with starter and grower feeds that contain an anticoccidial drug.
- It is important to maintain a strict sanitation program to prevent the disease.
- Marek's Disease is a virus that spreads through the air. It is a common, but untreatable, disease. You can prevent it from your flock by purchasing stock from a reputable source. Always ask for proof that the birds were vaccinated for Marek's Disease.
- To help reduce the incidence of this disease, follow a good sanitation program and management scheme that does not brood chicks of different ages in close proximity to adult birds.

## **Parasites**

- The most common poultry parasites are lice, mites, and worms.
- Feed stores stock insecticide dusting powders that are effective in reducing or eliminating the louse and mite problem. Check with your local Extension faculty for a list of insecticides approved for use on birds, roosts, and cages.
- Worms usually are not a problem unless birds are kept in outdoor pens used by previous generations of birds. The problem can become especially severe when winter temperatures have not been very cold or if chickens have access to standing water on the ground. Worms usually require a secondary host such as insect larvae or earthworms to infect a chicken. Chickens with worms may look healthy, but if they eat a lot of feed and remain skinny, their keel bone is more prominent than usual, or you see worms in their droppings, check with a local veterinarian.
- Over-the-counter wormers for chickens are available at feed stores. Eliminate most worm problems by keeping birds on wire floors. Nutrition Feed young birds a well-balanced ration to promote rapid growth.

## **Selecting, Preparing and Showing Pullets**

- Make a preliminary selection from your entire flock a week or two before the show.
- Examine all birds for their potential as a laying hen. How many eggs will they lay and how big will those eggs be?
- When making your final decision on which pullets to place in your pen there are several things to consider.
  - Depth and width of body: The hen should have a large enough body to be able to lay as many eggs as possible.
  - Width of pelvic bones: measure the width and depth of the pelvic bones. The longer and wider that measurement is, the larger the eggs will be.
  - Most importantly the pullets need to match. They should have the same depth and width of body and have the same measurements of the pelvic bones. You want all of the 3 birds in your show pen to be as close as possible so that if the judge were to close his/her eyes they would all feel the same.
- After selecting your birds, make sure you give them a beauty bath.
  - Always sponge or rub the bird with the feathers, not against them.
  - Rinse the bird completely after shampooing, removing any residue.
  - After rinsing, remove extra water from the bird with a towel and allow the bird to dry.
- Before the show, spot clean your birds, make sure the comb and waddles shine. Check the shanks and feet as well. The judge likes clean chickens!

### **Chicken Showmanship**

- Always take clean birds into the show arena for showmanship.
- Always put a bird into or take a bird out of the cage headfirst.
- Make sure you hold your bird securely so that it feels safe. Grasp the birds legs between your fingers and rest the breast bone on your arm.
- When showing your birds, be proud of a job well done. Demonstrate to the judge all that you have learned.
- Have Fun!

### **Preventing Health Problems**

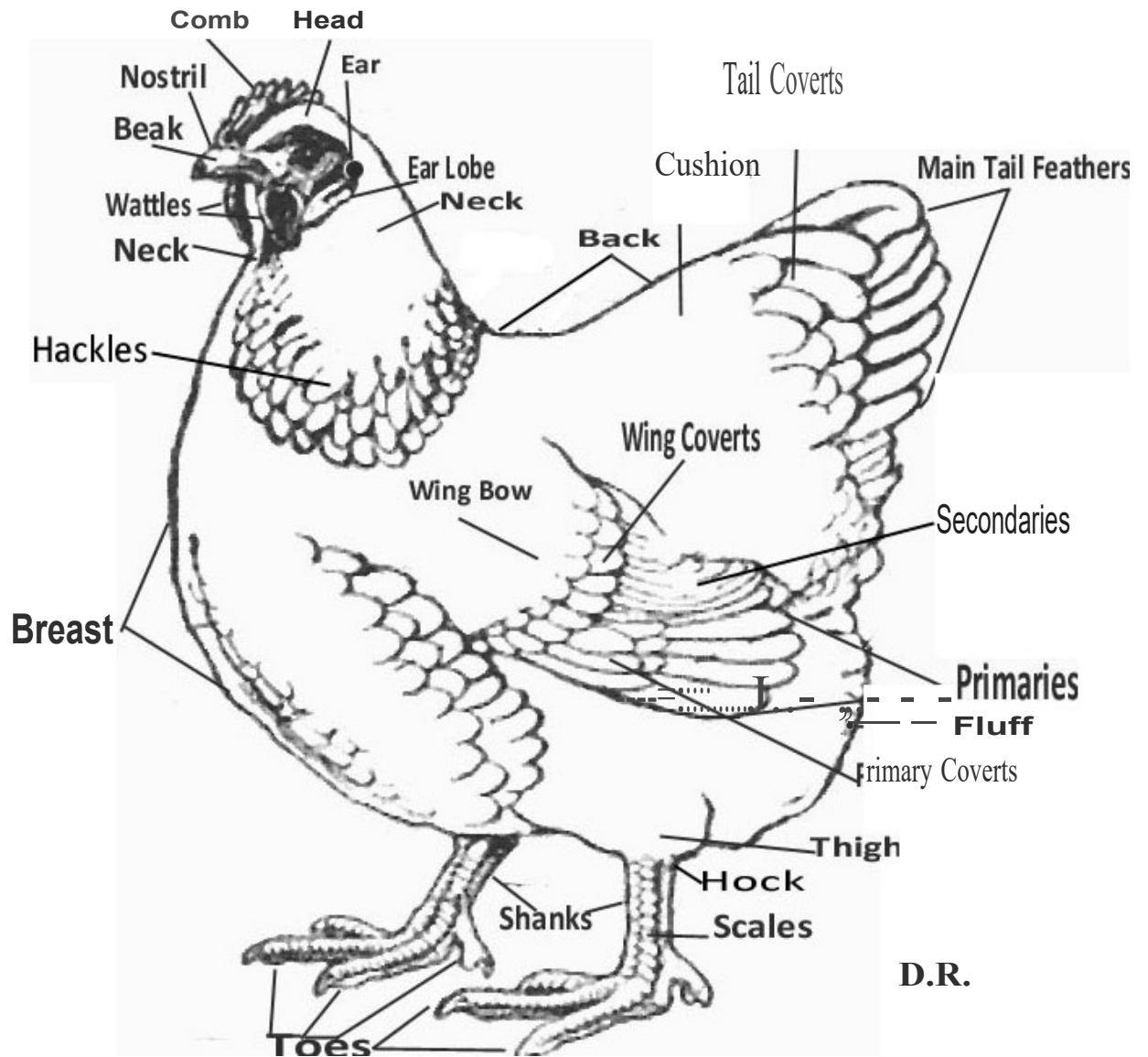
- If your flock becomes sick, it is important to obtain an accurate diagnosis. The problem can be poor nutrition, poor management, or an infectious disease. You need to know the source of the problem in order to treat the birds properly and prevent future losses. Check your flock daily to spot diseases or parasites so you can start treatment right away.
- For more information about identifying and treating poultry diseases contact your local veterinarian.
- Everyday sanitation: Disease is often transmitted from older birds to younger ones. Feeders need to be cleaned frequently to remove caked feed. Never use moldy feed.
- Wash your waterers daily and disinfect at least once per week using a brush to clean them out.
- Proper ventilation in the brooder and the coop will reduce moisture and disease organisms.
- Caked or wet litter should be removed as soon as it forms to keep the house clean and dry.

### **Biosecurity**

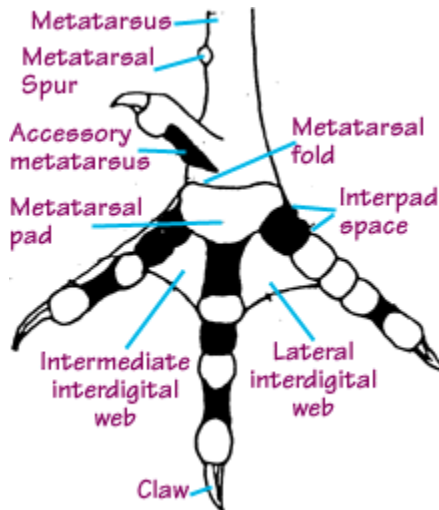
- A good sanitation program is essential to a successful 4-H poultry project.
- Thoroughly clean and disinfect the place in which the ducklings are to be brooded at least 1 week before the ducklings arrive.
- Remove all litter and manure from the previous brood.
- Scrape or sweep bits of manure and other debris from the sidewalls and floor.
- Sweep the dust from the sidewalls and ceiling. This is important because one tiny bit of manure can harbor millions of disease-causing organisms for months.
- Thoroughly wash the brooding area with water and a good detergent. After the area has dried, disinfect the area with an approved disinfectant (ask your local Extension faculty for advice).
- Thoroughly wash and rinse all waterers and feeders and set them in the sun. The sun is one of the best disinfectants available, but it must strike all surfaces. Turn the equipment for complete coverage.
- Place a pan of disinfectant near the door and always step in it when entering or leaving the chick brooding area.

- During the brooding period, one of the messiest areas in the house will be around the waterers. Lessen this problem by placing the waterers on raised platforms. Such platforms can be made using 2 x 4s. Cut four pieces of 2 x 4-inch boards into 30-inch lengths. Place the pieces on edge to form a square and nail the corners. This makes a platform 4 inches high and 30 by 30 inches square. Cover with 1-inch hardware cloth or welded wire fabric.
- When bringing in new adult birds or returning birds to your flock after showing, it is a good idea to quarantine them for about 2 weeks prior to returning them to the flock.
- Chickens that appear healthy may be carrying disease organisms from contact with other birds.
- A quarantine area consists of several small pens that are a distance from your main flock. Care for the quarantined birds after caring for the rest of your flock. If the birds in quarantine are infected, they will show signs of disease in 2 to 3 weeks.

# External Parts of a Hen



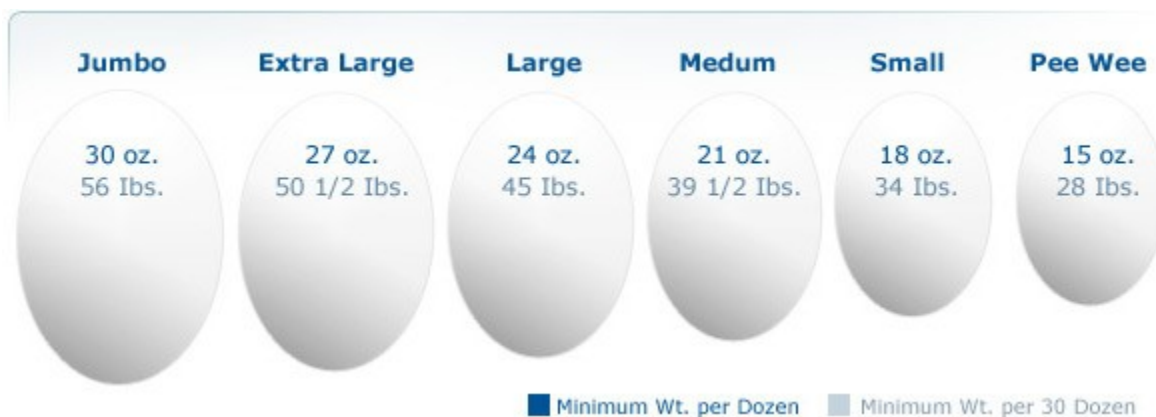
## Parts of a Chicken's Foot



## Egg Grading

When **grading eggs**, both the interior and exterior quality is measured. This process does not take into account weight or shell color. According to USDA guidelines, **eggs** are **graded** and labeled as AA, A, and B. U.S. **Grade AA eggs** are nearly perfect. The whites are thick and firm and the yolks are free from any defects.

## Egg Sizes



## **Glossary of Terms**

**Abdomen**—The underpart of the body from the point of the keel to the tail.

**Amino Acids**—Amino acids are building blocks of protein. For example, if a brick wall represented protein, each brick in the wall would be an amino acid.

**Anticoccidial**—A drug to prevent coccidiosis.

**Axial feather**—The short feather growing between the primaries and secondaries of the wing.

**Bantam**—A diminutive fowl—some being distinct breeds, others being miniatures of a large breed or variety, approximately one-fourth to one-fifth their size. Usually ornamental in character, some breeds have considerable merit as egg producers, a few as meat fowl.

**Breast**—The entire forward part of the body of live fowls from the juncture of the neck and body down to the rear point of the keel bone.

**Brood**—1. A distinct group of birds, usually of the same age, placed as a group. 2. The act of rearing chicks using heat and other management options.

**Cock**—A male fowl 1 year old or more. Cockerel—A male fowl less than 1 year old.

**Condition**—The state of a fowl with regard to health, including cleanliness and brightness of plumage, head parts, legs, and feet.

**Coverts**—Those feathers that cover the base of the primary and secondary wing and main tail feathers.

**Dubbed/dubbing**—A term used to describe the close trimming of the comb, wattles, and earlobes of the male.

**Earlobes**—The fleshy patch of bare skin below and behind the ears, varying in size and shape with color, either red, white, blue or purple, according to the breed.

**Enamel-white**—The satinlike white surface color found in the earlobes of Mediterranean breeds.

**Faking**—A self-evident attempt to remove or conceal a disqualification or serious defect to create merit which does not naturally exist; results in disqualification.

**Hock**—The joint between the lower thigh and shank, sometimes incorrectly referred to as the knee.

**Keel**—In chickens and turkeys as well as most birds, large bony protrusion on the midline of the breastbone; it resembles the keel of a boat, both as to shape and position.

**Keelbone**—The large bony protrusion on the midline of the breastbone or sternum.

**Line-breeding**—Mating of distantly related individual birds.

**Plumage**—The collective feather covering of the entire body of a fowl, including the head, neck, wings, tail, and, where specified for breed, the shanks and toes.



**Poult**—The young of the domestic turkey before the sex can be determined.

**Poultry**—A general term applied to all domesticated fowl, including chickens, turkeys, and waterfowl.

**Primary feathers**—The long, stiff feathers of the wing, growing from the last segment of the wing. When at rest, these feathers are folded under and are completely hidden by the secondaries when the wing is properly folded; also known as “primary flight feathers.” These feathers are responsible for power during flight.

**Pubic bones**—The thin, terminal portion of the hip bones that form part of the pelvis. Considered important in evaluating productivity of the female fowl.

**Pullet**—For exhibition purposes, a female fowl less than 1 year old.

**Secondary feathers**—The long, stiff wing feathers growing from the middle wing segment. When the wing is folded, the exposed secondaries form a triangular area known as the “wing bay.” These “secondary flight feathers” are responsible for lift during flight.

**Shank**—The portion of the leg below the hock, exclusive of the foot and toes; the metatarsus.

**Spur**—A stiff, horny projection from the rear inner side of the shanks, rounded or pointed according to age, prominent in the male fowl, may be present in female fowl, increasing greatly in size with age.

**Stern**—The rear underpart of a fowl extending from the rear end of the keel bone to the ends of the pubic bones.

**Sternum**—The breastbone to which the ribs and keel are attached.

**Strain**—Fowl of any breed or variety that have been line-bred for a number of years and that reproduce uniform characteristics with marked regularity.

**Stub**—A short section of the stem of a feather, sometimes with a few short barbs attached. A disqualification when found on shanks or between the toes of clean-legged breeds

**Uropygial gland**—The oil or “preen” gland, the only skin gland in birds. A large gland opening on the back at the base of the tail feathers, secreting an oily fluid which the fowl applies to its feathers during preening. It is especially developed in waterfowl because the oil helps make the plumage shed water.

**Variety**—A subdivision of a breed, distinguished either by color, color and pattern, or comb.

**Wattles**—The thin, hanging growths of flesh at either side of the base of the beak and upper throat; usually much larger and longer in males than in females. Usually red in color, but purple in Sumatras and Birchen, and brown in Red Modern Games and Silkies. Should be fine and soft in texture, slightly concave in surface, regular in outline, and uniform in size