



KENTUCKY 4-H



PULLET PROJECT Production Manual



WHAT IS A PULLET PROJECT?

The pullet project is a 4-H program where you receive 10 pullet chicks to raise and then you bring 2 to the county 4-H Pullet Project show to be judged and auctioned off. The proceeds from the auction will go to the fund 4-H Pullet Project.

WHY PARTICIPATE IN A PULLET PROJECT?

The pullet project will teach you recommended management practices for growing and raising laying hens. You will do the following:

- Develop poultry management skills
- Learn to produce healthy chickens
- Develop awareness of business management
- Develop record-keeping skills (income and expenses)
- Contribute to your home food supply
- Realize the pride of accomplishment

WHO CAN PARTICIPATE IN PULLET PROJECT?

Any youth between 9 and 18 years of age as of January 1 can participate. You do not have to be a current 4-H member, but you will need to complete a 4-H enrollment form if you are not already a member. Before receiving your chicks, you and a parent must attend a mandatory training session. At this meeting you will receive valuable information to assist you in preparing for and raising your pullet chicks. You will also be given a date and location for receiving your chicks.

Remember that not everyone is suited for keeping a poultry flock. If you live in an urban or suburban area, make sure that you are permitted to keep poultry and that there are no city or local ordinances that ban you from keeping chickens. Chickens need to be taken care of every day. They need to be fed, provided clean water, and, once they start laying, having their eggs collected daily. Make sure that such activities fit into your normal daily routine.

HOW A PULLET PROJECT WORKS?

As a participant in the pullet project you will receive ten chicks in the spring. The chicks will be pullets (females) that are 1-2 days old. All the chicks will come from a hatchery participating in the National Poultry Improvement Plan (NPIP) and will be vaccinated. You will be able to choose from one of two breeds. You will feed and care for these pullets for approximately 20 weeks. At the end of this time you will bring two of your pullets to your county's 4-H Pullet Project Show and Auction. The pullets become the property of the Extension office to sell. The proceeds from the auction will go to fund the Pullet Project Program. This completes the pullet project. You will have the remaining pullets at home, which you can use to start an egg laying business.

WHAT WILL YOU NEED TO PARTICIPATE?

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| 1. Shelter | 6. Thermometer |
| 2. Feeders (for chicks and older birds) | 7. Light |
| 3. Waterers | 8. Perches |
| 4. Bedding material (dry wood shavings) | 9. Nest boxes (for when they start laying eggs) |
| 5. Heat source | 10. Feed |

1. SHELTER

Location – Think about BIOSECURITY and PREDATOR CONTROL

When you are thinking of where to put your chicken house, consider disease control and biosecurity. 'Bio' means life and 'security' is protection. A biosecurity plan for a poultry facility is a series of common-sense activities designed to keep disease out of your flock. It is good to fence off the area where you keep your chickens. Only let people who care for the chickens come into contact with them. It is also a good idea to keep your chickens confined to protect them from predators (see Figure 1). It is highly recommended you 'predator-proof' your facility. For the run, secure wire that is buried at least 24 inches to prevent digging by ground predators. If you cannot bury the wire, then bend it outwards at least 24 inches from the edge of the coop and make sure it is flush with the ground. It is good to walk the perimeter of the facility daily to check for signs that a predator has been trying to enter your coop.



Figure 1. A small chicken coop with attached run

Size

Make sure you have enough space for the number of chicks you get. For the brooding area you will need at least 0.5 square feet per chick. This is for the chicks up to about four weeks of age. You will then need to expand the area to one square foot per chick for the next four weeks. Plan on two square feet per chicken when the pullets are full grown.

Design

There are many options for housing design. The housing could be part of an existing facility, with outdoor access attached to it (Figure 2), or a stand-alone poultry house like Figures 1, and 3.



Figure 2. Example of a shelter as part of an existing facility with added outdoor access, nest boxes and perches



Figure 3. An example of a stand-alone poultry house with outdoor run.

Perches

While the chicks will not need them, it is best to provide the older pullets with perches. Perching is a natural behavior of chickens. Providing them with perches gives them a place to rest at night. The manure produced during the night will also collect in one place, making clean out easier. Perches can be as simple as those in Figure 2.

Nest boxes

When the pullets get older and closer to laying eggs, you will need to provide them with nest boxes such as the ones in Figure 4. The boxes should be 1-foot x 1-foot x 1-foot. You should provide at least 4 nest boxes for your flock. The nest boxes shown are good because they have a slanted roof, preventing the chickens from sitting there and messing up the top. They could be better but having a perch in front of the nest boxes so that the hens do not have to jump directly in the box. They can jump onto the perch and walk into the box. This reduces the likelihood that they will break the eggs getting in and out of the nest boxes.



Figure 4. Example of nest boxes

Dustbathing

Chickens love to dust bathe (see Figure 5). Providing your older chickens with a sandbox of sorts allows them to dustbathe which helps control external parasites.



Figure 5. Adult chickens dustbathing.

Lighting

Chickens are sensitive to the number of hours of light per day. They come into production with increasing day length and go out of production with decreasing day length. While the chicks should get 24 hours of light per day for the first few days to make sure they get off to a good start, they should not stay on constant light. If they are in a building in which you can control light, it is best to keep the birds on 8 hours of daylight. If you cannot control light it is best to raise the pullets starting in April and take advantage of the decreasing day length when they are of laying age. The number of hours of light per day should be reduced to natural day length, especially if they are going to be kept outdoors. When they are ready to come into lay (about 18 weeks of age), slowly increase the number of hours of light per day until you achieve 14 hours a day. This will light stimulate the pullets to come into lay. Maintain the 14 hours (or increase to 16 hours if natural day length gets longer than 14 hours) to keep the hens in production through the winter. Having lights in the chicken house will allow you to keep your hens in high production through the winter when days are getting shorter. A timer is a good idea so you can keep the lights constant every day without having to go out to turn them on and off.

Bedding

It is important to provide chicks with bedding material. Never use smooth, slick surfaces such as flat cardboard or newspaper since they can lead to leg problems. The bedding needs to be clean, mold-free, and dry but not dusty. The recommended bedding material is pine shavings, but alternatives include rice hulls, ground corncobs, and hay. Straw is not recommended unless it is chopped into 1-inch-long pieces. Put down three to four inches of bedding material before the chicks arrive.

2. EQUIPMENT

Feeders

It is important that the chicks be provided with sufficient feeder space so that all the chickens can eat at the same time. This will allow for uniform growth rate for all the chickens in the flock. Chickens are social animals and like to be able to eat at the same time. It is best to have different feeders for the chicks and the older birds. The feeders in Figure 6 are examples of two types of chick feeders. The feeder space for the straight feeder is twice the length of the feeder since the chicks can feed from both sides. The feeder space for the round feeder is equal to the circumference of the base. The feeder in Figure 7 can be used for any age of chickens as long as the height is adjusted as the chickens grow. For chicks, place the feeder on the floor. As the chickens grow, the lip of the feeder should be placed at the height of the back of the chicken.



Figure 6. *Two examples of chick feeders.*



Figure 7. *Example of tube feeder that can be used for any age of chickens.*

Waterers

Chickens won't eat if they can't drink. Chickens will typically drink twice as much water as feed. So, if they eat 1 pound of feed, they will drink about 2 pounds of water (1 quart). It is important to provide fresh, clean water every day. You have a couple of options as shown in Figure 8. Both types of waterers can be used from chicks to adult, you just need to adjust the height of the waterers as the chicks get bigger. The open waterers tend to get full of shavings and feed, and it is easy to spill the water making the bedding wet. The nipple drinkers are an excellent way to make sure that they have clean water, with less mess, but it is essential that you regularly verify that the nipples are working.



Figure 8. *Two types of waterers that can be used for both chicks and older chickens.*

Heat source

Chicks are not able to regulate their body temperature for a few weeks after they hatch. As a result, supplemental heat must be provided.

The most commonly used heat source is a heat lamp like the one in Figure 9. If using a heat lamp, make sure that you use a porcelain socket and hang the lamp from a chain so that it does not fall into the litter and start a fire. You adjust the heat by raising or lowering the heat lamp. There is a new heat source available on the market that you can use as well. It is called a 'sweeter heater' (Figure 10) and it is less of a fire hazard.



Figure 9. A heat lamp.



Figure 10. Sweeter heat showing the underside and the chain the comes with it to hang the heater.

Thermometer

It is good to have an outdoor thermometer for the poultry house, placed at chick level, so that you can monitor the temperature. The use of a maximum/minimum thermometer is best so that you can make sure that the temperature does not go too low overnight.

Brooder guard

The chicks are typically kept in an area around the heat source, surrounded by a brooder guard. The brooder guard prevents the chicks from wandering away from the heat source and getting cold. Most brooder guards form a circle around the heat source. The size will depend on the number of chicks and the heat source. The size of the ring should allow the chicks to move to and away from the heat source so that they can regulate their temperature. Corrugated cardboard about 12 inches high makes a great brooder guard. It is typically removed after 7-10 days.

3. FEED

You will need to supply your flock with feed. Start out using a commercial chick starter/grower. Do NOT use scratch feed (cracked corn or other grain), laying mash or table scraps. Although the cost of scratch feed is lower than chick feed, it will not save you money in the end. Your pullets will not grow properly if feed is diluted with scratch feed. Mixing scratch feed with chicken feed reduces the protein level as well as the vitamin and mineral content of the final feed. The chicks will be less resistant to disease and will pick at their feathers, which can lead to cannibalism. In addition, the pullets will not lay as many eggs as chickens fed a balanced, complete feed.

It is important to provide the right feed for the right age of birds. Do not feed layer feed to young chicks. Such feed is too high in calcium and will harm the birds. You need to feed a chick feed. Once your chickens are ready to lay you will need to switch to a layer feed. Do not feed chick feed to the layers because it is too low in calcium and they will not be able to produce eggs. See the Factsheets ASC-216, 'Reading a feed tag' and ASC-191, 'How much will my chickens eat?', for more information.

Make sure that your feed is securely stored. It is recommended that the feed be stored in metal trash cans, with a secure lid. This will prevent rodents from being attracted to the feed. Clean up all feed spills immediately. It is good to put out traps in the feed room occasionally to make sure that you do not have rodents such as mice. You should also put out traps if you see rodent droppings.

BASIC POULTRY MANAGEMENT

Before taking your chicks home, examine them to confirm that they have well-healed navels (Figure 11). Just before the chick hatches, they take what is left of the yolk material in the egg into their abdomen. It is important that this seals completely so that it does not become infected.



Figure 11. Examining the abdominal area of the chick

Brooding

Brooding refers to providing your chicks with artificial heat and special care. Young chicks cannot regulate their own body temperature, which is about 104°F. As a result, you need to provide chicks with extra heat for the first 4-6 weeks of age. Heat must be provided until the chicks are well-feathered.

Typically, the temperature is started at 90-95°F for the first week. The temperature is then reduced by 5°F every week until about 70°F. The temperature should be monitored daily, at the chick level. While it is important to monitor brooding temperature, the best way to know if you have the right temperature is to observe the behavior of the chicks. When the temperature in the poultry house is correct (Figure 12a), the chicks will spread out throughout the brooding area. They will move around the brooding area and access the feeders and waterers. If the temperature is too cold (Figure 12b), the chicks will huddle together under the heat source trying to get warm. The solution, of course, is to increase the temperature. For a heat lamp, this means lowering the height of the lamp. If the temperature is too hot (Figure 12c), the chicks will try to get as far away from the heat source as they can. The solution is to decrease the temperature but raising the heat lamp. If the chicks are avoiding an area there may be draft (Figure 12d). Try to identify the source of the draft and correct it.

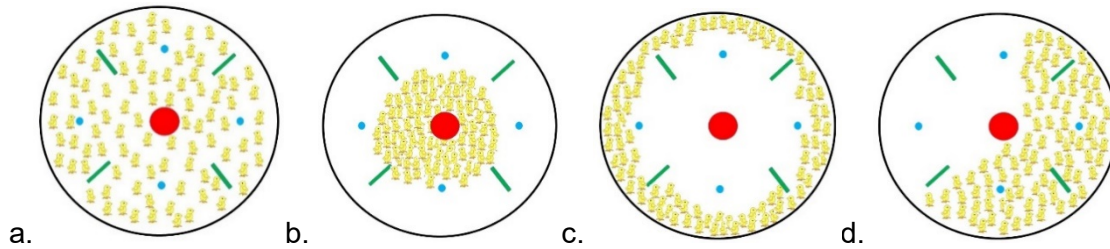


Figure 12. Comparison of the behavior of chicks in a brooder ring during different environmental conditions: a. ideal conditions; b. too cold; c. too hot; and d. draft

When you first place the chicks in the brooding area it is important that they learn to drink. Dehydration is the most common cause of death in young chicks. When using an open-source waterer, the best way to teach the chicks to drink is to dip their beaks in the water (Figure 13). If using nipple drinkers, touch the beaks to the nipples (Figure 14). You should teach every chick where the water is.



Figure 13. Teaching a chick to drink from an open-source waterer.



Figure 14. Teaching a chick to drink from a nipple drinker.

It is important that the chicks start eating as well. Make sure the chicks always have fresh feed in front of them. At the same time, however, you don't want them wasting feed. For the first day or two you can place the feed in egg cartons until they become accustomed to chick feeders. After that, always put the feed in a feeder. Do not throw the feed on the ground for the chicks to pick up.

Leave the lights on all day and night for the first 2-3 days. This will give the chicks time to learn where the food and water are. After that, there should be a period of dark each day so that the chicks become familiar with the dark. To confirm that the chicks are eating, handle them at 24 hours to evaluate the crop fill. The crop is located just under the skin at the base of the neck. The crop should feel soft and round. If the crop is empty, they have not found feed, and this is needs to be corrected as soon as possible.

It is important to adjust the size of the feeder as the chick grows. You will also need to adjust the height. As the chicks grow, the feeders and open-source waterers should be placed at the height of the back of the chick. Nipple drinkers should be placed above the chicks so that they must reach up for the nipple. Monitor feed and water consumption daily.

Brooding check list

Before the chicks arrive

- Prepare the poultry house at least 24 hours ahead of time.
 - Turn on the heat source.
 - Place 3-4 inches of bedding material down.
 - Layout the brooding area including the feeders and waterers.

Picking up the chicks

- Check the chicks for quality, including well-healed abdomens.

Placing the chicks in the brooding area

- Dip the beaks of each chick into the waterer, or against the nipple drinkers.
- Leave the lights on all day and night for the first few days.
- Make sure the chicks have easy access to feed and water.

After 48 hours

- Handle the chicks and evaluate crop fill to ensure that the chicks are eating.
- If the chicks are eating, reduce the number of hours of light to 20 hours per day.

After 7 days

- Remove the brooder guard.

BIOSECURITY

As mentioned earlier, biosecurity refers to the things you do to protect your flock from disease. Here are some key points you should remember.

1. Restrict access to your property and birds

It is good to fence off the area where you keep your birds and only let people who care for the chickens come into contact with them. If you have visitors who would like to see your flock, make sure they have clean shoes. It would be even better if you could provide your visitors with clean boots or have plastic booties available for them to use. If your visitors have their own birds, they should not be allowed to come near your birds. In addition to keeping people away from your flock, try to keep wild birds away as well. These birds can carry disease and parasites. Do not keep bird feeders, bird houses, or bird baths on your property.

2. Keep it clean

Disease-causing germs can be picked up by your shoes and clothes and transported from one area to another. It is recommended that you have a pair of shoes and a set of clothes that you wear only when caring for your chickens. Always wash your hands before entering your bird area. For your protection, do not forget to wash your hands thoroughly with soap and water after you have cared for your chickens.

Keep the poultry house clean. Clean and disinfect any equipment that comes into contact with your chickens or their droppings. That includes equipment such as feed scoops, shovels, rakes and brooms. Disinfectants won't work on a dirty surface, so make sure that all manure and other debris is removed from the surface first.

3. Do not bring disease home

Vehicle tires, poultry cages, and equipment used to take care of your chickens can all harbor disease causing germs. If you travel to a location where there are other birds, be sure to clean and disinfect these items before you return to your property. This can even include a trip to the feed store.

4. Do not borrow disease

It is strongly recommended that you do not share lawn and garden equipment, tools, or poultry supplies with your neighbors or other bird owners. If you do, make sure that they are cleaned and disinfected before they are brought onto your property. Just as important, remember to clean and disinfect any items that you borrow before returning them. Never share items that cannot be disinfected. This would include wooden cages or cardboard egg cartons.

POULTRY HEALTH

Monitor your chickens daily and look for anything that might indicate that something is wrong. Early detection of disease is very important to containing it. Indications of disease include:

- Sudden death
- Diarrhea
- Respiratory signs including sneezing, gasping for air, nasal discharge, or coughing
- Reduced feed consumption
- Reduce bird activity
- Swelling of tissues around the eyes or neck
- Purple discoloration of the wattles, combs and/or legs
- Nervous disorders such as muscular tremors, drooping wings, twisting of head and neck, incoordination, complete paralysis

SELECTING CHICKENS FOR THE POULTRY SHOW

At the end of the project you are to select two pullets to bring to the 4-H Pullet Project Show and Auction. These pullets become the property of the Extension office to sell. The proceeds from the auction are used to offset expenses accrued during the project.

The chickens should be clean, not have any broken feathers, and clean legs and feet. The comb should be free of scars and blemishes. The chickens should not be molting (losing feathers). Make sure that there are no defects such as crooked keel bone (the breast bone), breast blisters, bumblefoot, or deformed toes. Uniformity of the pair is also a criterion that is judged so select two pullets with similar characteristics.

The chickens will be judged on their production characteristics. They will be evaluated based on criteria used to estimate their future egg production. The American Standard of Perfection from the American

Poultry Association is never used to evaluate production pullets. The first thing is to identify which chickens are already in production. The same hormones that cause a pullet to come into production cause other changes in her body as well. The comb and wattles increase in size and soften. The abdomen becomes enlarged, soft and pliable. The distance between the two pubic bones and between the pubic bones and the tip of the keel increases. The vent becomes moist and wide. A pullet that has not yet started egg production will have small and hard comb and wattles. The vent will be dry. The distance between the pubic bones and between the pubic bones and the tip of the keel will be small. The abdomen will be firm, and in some cases, hard. See Factsheet 4AJ-07P0, 'Kentucky 4-H Poultry: Evaluating egg-laying hens' for how to evaluate egg laying hens for past and current level of production.

Body capacity is another factor which is evaluated. The body of the chicken is filled with organs. If a part of the body is narrow the organs in that area cannot function at optimum levels. You want pullets that have some distance between their legs without appearing bow-legged. You want the pullets with full, well-rounded breasts and with legs set well back. The body of the pullet should not be quite rectangular. Usually the rear is deeper than the front. This allows for more room for the egg producing organs.

POULTRY SHOWMANSHIP

The poultry showmanship contest is an opportunity to demonstrate your skills at caring for your flock as well as your ability to communicate your knowledge of the flock and their care to the others. Showmanship is about you. Your attitude, appearance, speaking ability, care and management skills, and ability to follow instructions are what are judged. Appropriate clothing includes a 4-H shirt (or other green or white shirt), pants, and closed-toed shoes (no flip-flops). Shirts should be tucked in, hair combed, and you should be clean and neat. Shorts, shirts that advertise, hats, chewing gum or tobacco are all inappropriate.

For the younger 4-Hers (9-11 years of age) the focus is on the basics. Skills to be evaluated will include removing the pullet from the cage and holding it correctly will be evaluated. Personal safety and the well-being of the pullet is stressed throughout. Questions that can be asked will be about basic management. Participants should know simple anatomy and have a knowledge of the breed and variety of the pullet they are showing.

For slightly older 4-Hers (12-15 years of age), handling skills should be more developed. You should be able to pass the chicken to another person as well as examine the wings, under-color, feet and head. You should be able to do a physical examination of your pullet and give an oral evaluation. Questions can include such topics as poultry diseases, parasites and additional anatomy. Refer to the Factsheet, ASC-206, 'Common external parasites of poultry' for more information on external parasites.

For the oldest group (16-18 years of age), participants are expected to show advanced handling skills, as well as logical thinking and problem solving. Questions can include cures associated with poultry diseases and remedies for poultry management problems. You should have a broad poultry vocabulary and do well with terms and definitions.

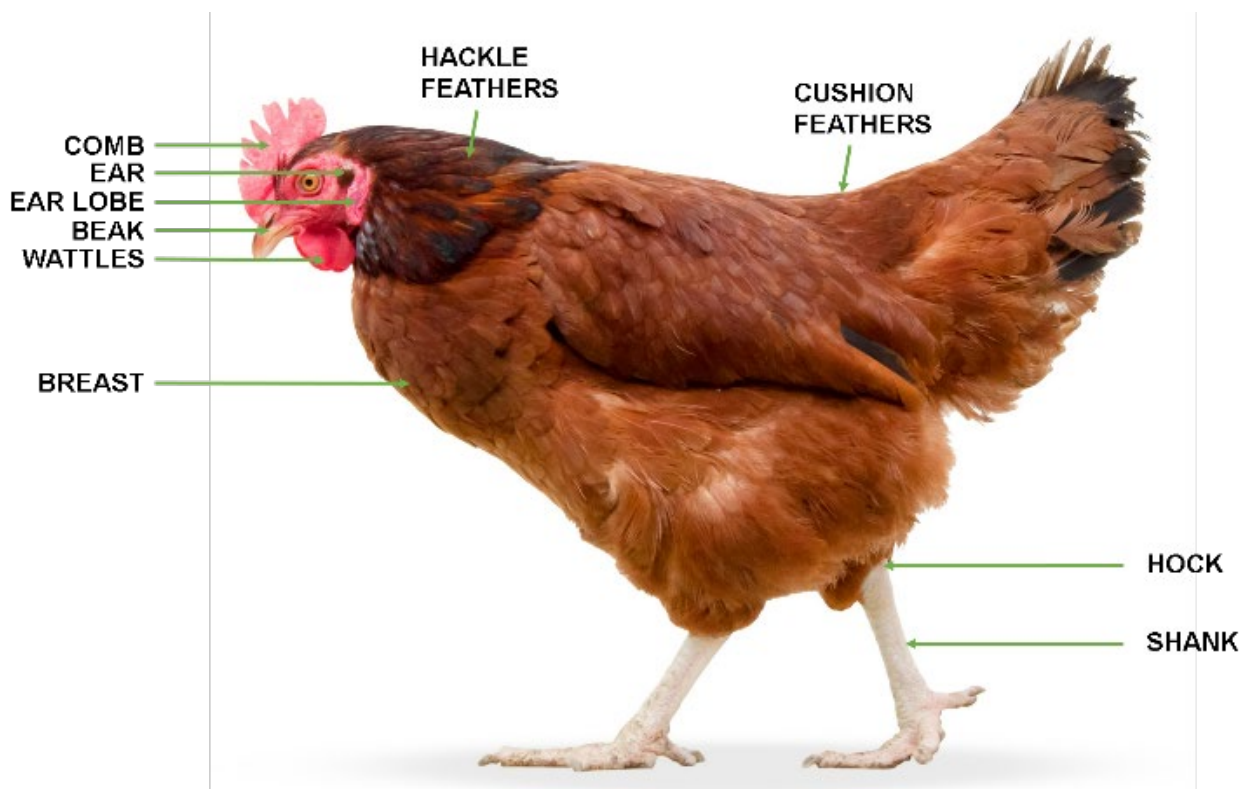


Figure 13. Basic anatomy of a chicken

POULTRY TERMINOLOGY

Cock: Adult male chicken

Cockerel: Young male chicken

Crossbred: Offspring of parents from different genetic makeup

Flock: More than one chicken kept in one place

Fowl: A term primarily used for chickens, but also applied to most ground-nesting, seed-eating birds

Hen: Adult female chicken

Nutrients: The individual components of a feed or feed ingredients

Pullet: A young female chicken

EXAMPLES OF BREEDS OF PULLETS THAT MAY BE USED:

Barred Plymouth Rock



Figure 14. Barred Plymouth Rock hen

The Plymouth Rock is an American breed of chicken that was developed in Plymouth, Massachusetts in the late 1900s. The breed quickly rose in popularity in the United States because of its egg-laying capabilities while still being a good meat chicken. This makes it a great dual-purpose breed. It is kept for both meat and for its large brown-shelled eggs. Properly managed, the hens can produce about 200 eggs per year.

The Barred variety of Plymouth Rock was the first to be developed (Figure 14). The barred coloring is distinct. It starts on the feathers and continues down to the skin. On the male, the black and white bars are of equal width and end in a dark tip. In the female, the black bars are slightly larger than the white making the hen darker in appearance. The barring coloring pattern is due to a sex-linked gene. Rather than adding dark bars to light feathers, the gene prevents pigment on colored plumage, thus creating the lighter bars on dark feathers. The male carries two copies of the gene while the female carries only one copy, which is why the females are darker in color.

The Plymouth Rock has a single comb with five points. The eyes are reddish bay in color, and the comb, wattles and earlobes are bright red. The beak, shanks and toes are yellow.

The Plymouth Rock breed was used in the development of the commercial meat-type chicken used today.

Rhode Island Red



Figure 15. Rhode Island Red hen

The Rhode Island Red (Figure 15) is also an American breed. It was developed in the late 19th century in Massachusetts and Rhode Island. The Rhode Island Red is the state bird of Rhode Island. The Rhode Island Red was developed as a dual-purpose breed to provide both meat and eggs. The hen typically lays 200-300 eggs per year. This makes the Rhode Island Red one of the best egg layers of the dual-purpose breeds. Because of their high levels of egg production, Rhode Island Reds were used in the creation of many modern hybrid breeds.

Although Rhode Island Red chickens used to be very red, but the modern version is more of a deep reddish brown with a small bit of black feathering. The chickens have bright red eyes, a single comb and bright yellow legs.