

# Raising Range Fed Broilers as a 4-H or FFA Project

Poultry project members may find raising multi-colored, range fed broilers a rewarding and profitable enterprise. Private sales, local farmers markets and restaurants that feature “organically grown-locally sourced entrées” can provide niche markets for processed meat chickens.

Nevertheless, in head-to-head competition in the show ring at county fairs will lean toward the familiar white hybrid (Cornish/Cross) broilers because of economic efficiency and conformation factors

Show officials, parents and project members should recognize the genetic and environmental differences between range-fed and white hybrid broiler meat birds. Differences between range fed broilers and hybrid white broilers are comparable to the beef industry where there are considerable differences between beef breeds, dairy breeds and “grass fed” beef steers.

## The “Chicken of Tomorrow”

To understand our poultry industry today, we need to look at the history of the poultry industry.

In times gone by, chickens were kept as a side-line to other farming enterprises. The emphasis in chicken production was on egg production. Standard bred and land races of chickens met the need for white or brown colored eggs. Meat was a by-product, provided when the layer’s egg production diminished or by low value young cockerels that were raised with the high value replacement pullets. “Dual purpose” standard-bred American or English breeds had little significance on meat production. Even caponized (castrated) Asiatic breed cockerels were only noteworthy as a specialty meal. Typically, a 16 week old broiler would weigh 2.5-4 pounds. Many county fair premium books still reflect this type of meat bird.

The seeds of change were sown in the 1920’s and 30’s when specialized egg farms began to expand in New England and the Midwest. A few specialized broiler operations appeared in the Delmarva (Delaware, Maryland and Virginia) region, but not enough to make a significant difference in supply of chicken meat.

The return of the GI’s following World War II brought about major changes in American society. America was exporting beef and pork too war-torn Europe and the “Baby Boom” created a high demand for inexpensive protein. This created the urgency for the poultry industry to develop a fast-growing and efficient meat type chicken.

The Great Atlantic & Pacific Tea Company (or commonly known as the A&P store), the country’s largest poultry retailer, was first to recognize this need. In 1945, in partnership with USDA and Cooperative Extension, A&P set about producing a chicken that would grow bigger, faster and have a larger percentage of breast meat and plump legs and thighs.

A competitive event, called “The Chicken of Tomorrow” was launched that year to find the farmer/producer that could develop the genetics to meet the needs of the consumer. A&P offered \$10,000 in prize money nationwide to encourage participation.



The long, narrow carcass on the left was typical of the broiler being produced in the U.S. prior to 1948. On the right is a wax model of what “The Chicken of Tomorrow” contest organizers envisioned. The ideal bird would have a large percentage of breast meat and plump legs and thighs.

The committee used the same principles set down by the 18<sup>th</sup> century English scientific farmer, Sir Robert Bakewell: Written standards and score cards, models of the ideal carcass and evaluation of large numbers of animals. These principles led to the establishment of purebred associations such as the American Poultry Association in 1874.



In the mid-eighteen century, **Robert Bakewell** of Dishley, England developed a system that revolutionized animal breeding. His work led to the development of the Leicestershire sheep, Shire horse, Small White pig, English Longhorn cattle and by direct association, the Shorthorn cattle.

Bakewell's breeding system included three factors: 1) the establishment of specific and written goals and outcomes

2) breeding only the best to the best 3) proving the genetic characteristics of sires by leasing them out to other farmers and evaluating the resulting offspring.

The goals that he established are the Standard of Perfection that we use to evaluate purebred poultry today. His sketches describing the most desirable characteristics that he strove to achieve. The skeletons of livestock that lined the halls of his home provided physical references, much like the models do today.

Refusing to keep any animal that did not meet his strict standards for his breeding program was unique in Bakewell's day. Only the most desirable animals were bred together, in order to produce the highest quality offspring.

Finally, he proved the genetic superiority of his sires by breeding them to a large number of animals in many herds. Bakewell then assessed the genetic advancements of the offspring,

In 1946 and 1947, a series of state and regional "Chicken of Tomorrow" contests were held. Chicken farmers and breeders from across the country took part in the contest. They submitted 720 eggs for hatching at specially built facilities where the chicks were hatched and raised in controlled conditions on a standard diet. The chicks were closely tracked and monitored for weight gain, health and appearance. After 12 weeks, the birds were slaughtered weighed and judged according to the standard scorecard.

From the state and regional winners 40 finalists were chosen to compete for the national title of Chicken of Tomorrow. The national winner for *carcass characteristics* was Arbor Acres owned by Henry Saglio, Glastonbury, Connecticut. The White Plymouth Rocks' white colored feathers gave them the edge.

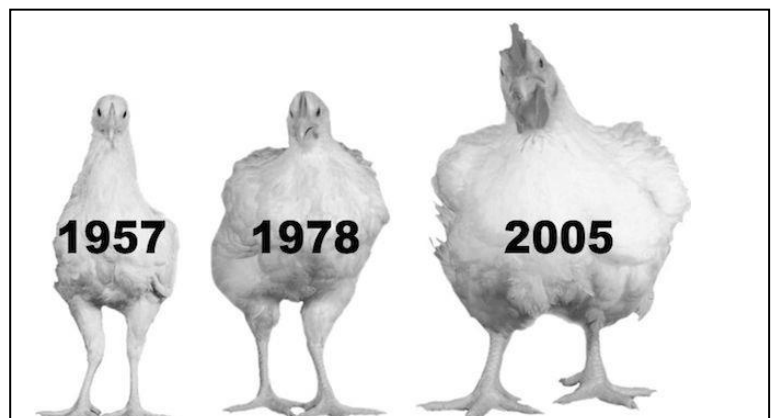
The Red Cornish crossed with New Hampshire Reds submitted by Vantress Hatchery, Charles and Kenneth Vantress, Marysville, California, won the *economy of production* for feed efficiency, live weight.

Ultimately, the two lines were crossed, giving us the red-shouldered, pea combed Cornish Rock Cross meat chicken. Today's broilers are white and single-combed hybrids.

"The Chicken of Tomorrow" contest not only gave us *the chicken of today* but also the specialized poultry genetics sources that dominate the poultry industry. Arbor Acres® along with Indian River®, Peterson® and Ross® are brand names of Aviagen Broiler Breeders, supplier of day-old grandparent and parent stock chicks to customers in 130 countries worldwide. Cobb-Vantress is a global company using innovative research and technology to make protein available, healthy and affordable worldwide through the development, production and consistency of our high-quality broiler breeding stock.

Henry Saglio and his son, Robert, started Avian Farms International, a broiler and roaster breeding business. At the age of 87, the elder Saglio also founded Pureline Genetics after concerns were raised about chickens bred with antibiotics.

Today, Cobb-Vantress Inc. is owned by Tyson Foods, headquartered in Arkansas, the site of the 1951 "Chicken of Tomorrow Contest."



“The Chicken of Tomorrow” contest, like the advancements in hybrid egg production hens, fractured the poultry industry from centuries of purebred breeding. Scientific principles of genetics replaced the art and eye of the purebred poultry producer.

Winners of the contest were lauded for producing a four pound broiler in 12 weeks with 12 pounds of feed. With controlled environment housing, prescription rations and careful bio security, the *chicken of today* touts a five pound broiler in about 42 days with less than 10 pounds of feed!

Today the average American eats around 70 pounds of chicken a year, five times the 1950 amount. At any given time, 20 billion chickens (That's three for every human!) are alive on our planet and nearly all of them can trace their ancestry back to Vantress or Arbor Acres stock!

## Is the *Chicken of Today* the chicken of future?

Some producers and consumers are looking for bird that tastes better, grows on a more diverse diet and lives in a more “natural” environment. Still others insist that their food be produced under strict “organic” methods.

In the US, a grassroots pastured poultry movement has been growing since the early 1990s. Poultry raised on pasture are processed on-farm, or in state inspected custom slaughter plants and direct marketed to consumers, creating supplemental income on small diversified family farms.

The French *Label Rouge*, which also started out as a grassroots program, provides an example of what is possible when farmers, consumers and organizations work together.

*Label Rouge* began 40 years ago as a grassroots movement led by visionary farmers. As poultry became more industrialized after World War II, demand grew in France for the taste of traditionally raised farm chickens. *Label Rouge* performance has been called 'stunning' and now accounts for 30 per cent of poultry sales to the public, in spite of its high price – twice the price of conventional poultry.



**Table 1. Label Rouge standards for broiler production**

|                                    |   |
|------------------------------------|---|
| <b>Genetics</b>                    | Only certain genetics are allowed – slow growing breeds suited for outdoor production.  |
| <b>Buildings</b>                   | Buildings are a maximum of 4,304 square feet. No farm can have more than four buildings. Building must be at least 98 feet from each other.   |
| <b>Maximum density in building</b> | The maximum stocking density is 0.98 square feet for a bird. No more than 4,400 birds are permitted in each building. Chickens require 2.2lb of litter each.  |
| <b>Access and size of range</b>    | All birds have access to the outdoors from 09:00 until dusk after six weeks of age, and must be outside for at least 42 days of grow-out. Range requirements are 22 square feet per bird. About two acres of land are needed per house. 1.2 feet of pophole exits are required for 100 square feet of building. |
| <b>Feed</b>                        | Feed must consist of at least 75% cereal and must be non-medicated; starter rations can be 50% cereal because of a higher soybean content. Rations cannot contain animal products, growth stimulants or other additives. Fishmeal is not permitted. Synthetic amino acids are allowed.                          |
| <b>Other</b>                       | Although routine medications are not allowed, antibiotics prescribed by a veterinarian are. Coccidiostats are permitted but must be withdrawn five days before slaughter. Vaccination is allowed; beak and toe trimming are not.  |
| <b>Slaughter age</b>               | Birds must be grown a minimum 81 days.  |
| <b>Dressed weight</b>              | Minimum 2.2kg without giblets   |
| <b>Sanitation period</b>           | There is a minimum sanitation period of 21 days between flocks.   |
| <b>Transport</b>                   | No more than two hours travelling time or 64 miles to processing plant  |
| <b>Processing</b>                  | Air-chill   |
| <b>Shelf life</b>                  | Sold fresh within nine days of slaughter  |

Chart adapted from François Paybou's *Technical and Economic Feasibility Study of Adopting French Label Rouge Poultry Systems to Illinois* (2000)

The *Label Rouge* program focuses on high-quality products, mainly meat, with poultry as the flagship product. It emphasizes quality attributes such as taste and food safety and free-range production practices. The average consumer can note a positive difference in taste between *Label Rouge* and conventional poultry – in fact, regular taste-testing is a certification requirement to prove that these products are 'vividly distinguishable' from conventional poultry, according to the program.

The main reason for the superior taste is considered to be the use of slow-growing birds instead of the fast-growing birds used in the conventional industry. The slow-growing birds are from specialty rustic genetic stock and are harvested close to sexual maturity. The meat is flavorful and firm, but not tough.



In Europe, the slow-growing genetics, accepted by *Label Rouge* are mainly supplied by the poultry breeding companies SASS0 and Hubbard.

Slow-growing birds are key in *Label Rouge* production – birds grow to five pounds in 12 weeks. (The fast-growing hybrid broilers of the conventional industry reach five pounds in six weeks.) Not only does slow growth allow the organs, muscle and bones to grow in harmony, it also results in a more flavorful meat. The carcass is generally more elongated and has a smaller breast and larger legs than conventional carcasses. In addition, slower growing breeds are more suited to outdoor production than the white hybrid broiler.

## Getting started raising range fed broilers

Now that you have decided to raise range fed broilers for your home use, a niche market or for county fair show, you will need to decide on the heritage breed or hybrid strain that you will raise.



Heritage breeds, particularly American, English and Asiatic breeds, could be a choice for your range fed broilers. However, you will experience the same results that producers saw prior to “The Chicken of Tomorrow” contest. These would include slow growth, low breast meat percentage and low feed efficiency.

Several breeds have natural advantages over others due to selection for meat characteristics when the breed was developed. Buckeyes with their rounded breasts and muscular thighs, due to Cornish and Plymouth Rock genetics, make a suitable choice. Some strains of New Hampshire Reds demonstrate specific meat characteristics such as early maturity, quick feathering, strength and vigor, for which they were developed.

If your “breed” decision is based on economic and carcass quality factors, several alternatives to the heritage breeds are available.

Several strains of white broiler hybrids can be raised on pasture with very acceptable results. Undoubtedly, they will produce very desirable carcasses. Actual tests and anecdotal evidence show that the white broiler hybrid will produce the highest economic return. And depending on the amount of supplemental grain-base feeds that are provided the birds, their rate of gain may be far superior to alternatives.







However, the fast growing, white broiler hybrids have inherent physical deficiencies when raised on pasture. Their extreme breast muscling places the bird's center of gravity forward and putting strain on their legs and thighs. Their bone and joint development is outpaced by their body mass, resulting in splay legs and ultimately, increased mortality.

The afflicted individuals can be processed before the conditions get too serious, thus salvaging the carcass.

Many commercial hatcheries offer "Slo-grow" or "Pasture Broiler" chicks. These are marketed by the names "Freedom Rangers," "Rainbow Rangers" or "Red Rangers."

An internet search will find several small family-owned hatcheries that exclusively feature chicks that thrive on pasture. Some offer their own-proprietary bred strains, but most like "Freedom Rangers" are actually Four-way cross hybrids, bred from parent stock that are produced by genetic companies.

Because these birds are terminal cross hybrids, using them for breeding purposes will result in unsatisfactory offspring.



A typical "Red Ranger" hybrid is fast growing and has desirable carcass qualities at 11-13 weeks of age.



"Freedom Rangers" are exceptional pasture-raised birds and come in diverse colors and body types.

The dramatic increase in demand for pasture-raised strains of broilers chick has caused hatcheries to expand their offerings these types of chicks. Prices for these chicks may be slightly higher than the white hybrid broilers.



Four-way cross hybrids, like Freedom Rangers exhibit a variety of phenotypes in color, stature and carcass qualities, yet vigor is exceptional.



## Rearing techniques for range-fed broilers

Feed suppliers, farm supply businesses, local hatcheries and mail order (online) hatcheries make good sources of strong, healthy baby chicks. Pooling your order with other project members can reduce your initial investment because discounts are usually given to larger orders. The few cents per chick charge for Merek's disease vaccination can provide great returns later on.

Mail order chicks will be shipped by US Postal Service during appropriate weather conditions. Chicks are usually sent out from the hatchery on Monday or Tuesday. With three-day guarantee delivery, you should receive them at your post office on Thursday or Friday.

They are mailed in a special box called a "Pullman." Each compartment is designed for 25 chicks, so orders less than 25 will include mail chick of unspecified breeds, just to fill the space and provide proper heat in transit.

Chicks can be artificially brooded like other poultry. However, since the goal is to raise the chicks on pasture, a "broody" hen that fosters them may get the chicks out on the range more quickly. This hen is sometimes called a "cluck hen" because of the clucking sound she makes. She is behaviorally and physiologically changed by her natural hormones and instincts to incubate eggs and rear chicks.

A "broody" hen that is best for fostering chicks is one that has been setting on a nest of eggs for several days. Some breeds make better mothers than others. Loose feathered Cochins, Rocks, Wyandottes and many crossbreeds are best, but individuals of other breeds may also be very satisfactory. A hen that is not "setting tight" may reject the chicks and even kill them.



The chicks should be introduced to the hen while she is in her nest box. Stay calm when sliding the chicken under the hen and keep her area darkened. It may even be necessary to cover her nest and restrain her in the box until she has accepted the chicks. Check the hen every little while to make sure that she has not rejected the chicks.



A good hen may be able to brood as many as 20 chicks! A large hen is not necessarily a better mother than a small hen. Not only will a hen keep the chicks the proper temperature, she will direct them to water and feed. She will help the chicks to explore their environment and begin to forage for insects and vegetation. She will provide warmth for the chicks and call them under her cover when they need protection. A hen will reduce energy costs but feed consumption will increase since the hen will consume chick starter feed.

A complete Chick Starter crumble insures that the babies receive a balanced ration in each bite. Whether the feed is medicated or non-medicated is the producer's choice. The medication in starter feed is Amprolium is an amoebicide that prevents coccidiosis. The drug is a "thiamine analogue" and blocks the uptake of the vitamin thiamine by the infectious microbe. By killing the amoeba in the chicks gut, the disease is prevented. Since the coccidiosis amoeba is found in soil and the intent is to get the chicks on pasture as soon as possible, this medication is recommended and allow under Label Rouge guidelines.





The chicks can be introduced to the range as soon as the weather is suitable. They will need supplemental heat during the cool nights.

Fresh pasture can be provided by moving the birds to new areas frequently. Native grass pasture is commonly used because of its durability and recovery after the birds graze it off. Legumes such as alfalfa and clover pasture will increase protein consumption. This will allow the supplemental ration to be higher in whole and cracked grains.

Electrified temporary fences will prevent the devastating on predators such as fox, raccoon and opossum.

If rapture predators like hawks, owls and eagles are a concern, roof netting may need to be applied. For a small number of birds, a chicken tractor will provide protection from above, but requires more labor and expense.



## It's County Fair Time!

The care of your birds throughout their growing period is essential for success at the fair. Make sure that you have entered in the correct class. Be sure to ask your leader and explain the intent and goals of your project.

Be knowledgeable of the practices that you used in raising your range fed broilers. Even if your fair does not have a separate class for range fed broilers, explain to your judge the differences between your birds and the white hybrid broilers. Be prepared to support your raising techniques with the financial data that proves your ability to be profitable and produce a more flavorful product.

Wash and groom your birds as you would any show bird. Oil the comb, wattles, feet and legs so that they are bright and attractive. Young, range fed chickens will not likely have external parasites, but check them to make sure.

During judging, stay alert and listen to instructions. Keep your eyes on the judge and smile during the evaluation of your birds. Stay relaxed in spite of the stress of the show and the heat of the day.



Determine the appropriate attire for your fair on show day. You need to look presentable and comfortable when handling your birds in front of the judge.

Always compete in the showmanship and demonstration competitions to demonstrate the knowledge you have gained in raising range fed broilers and to promote your birds.

Keep your display clean and neat! Good herdsmanship at fair will show the public your outstanding work. Most of all, have fun!

## Judging Meat Chickens

The criterion used for judging meat chickens is based on USDA Standards for Grading Poultry and animal husbandry practices. The same basic criterion applies to white hybrid broilers as range fed broilers.

**Disqualifications**—these factors would prevent the bird from being slaughtered for food purposes - automatic pink ribbon

Crippled—unable to stand and move normally, blind, crooked breast bone, breast blisters, broken bones, skin cuts, bruised flesh, illness and parasites (removed from the showroom by superintendent), absence of fleshing and finish (fat), objectionable dirt, staining and filth.

Properly fitted and groomed meat chickens are raised in immaculately clean conditions and are bathed prior to the show with oil applied to the combs, wattles, feet and legs prior to judging. Beef, sheep, swine and dairy project members are very aware of this fact.

## Desirable Market Factors

**Age and Weight (20 pts.)** – Most fairs establish the desirable weight

White hybrid broilers are 37-49 days old - >3.5 lbs. <6 lbs.

Range fed broilers are - >3.5 lbs. <6 lbs. 11-13 weeks old

County fair projects typically give more range of weight and age than the industry standard allows because of the wide number of uncontrollable factors for youth projects such as climatic conditions, date of delivery of chicks and population density.

Broilers should exhibit —youthfulness determined by appearance and the lack of molting of juvenile primary flight feathers. Chickens have 10 primary flight feathers. The juvenile feathers are pointed at the ends. Molting typically begins at 42 days and continues with 2-3 feathers per week until all 10 have been replaced with adult feathers. Birds that are slaughtered prior to molting primary flight feathers produce the greatest amount of meat per pound of feed consumed.

**Conformation (20 pts.)**— Like all animals, meat chickens should be structurally sound. They need to walk on a proper set of feet and legs and move freely and easily. Obvious extremes in body shape and structure are undesirable and lack —eye appeal.

**Fleshing (20 points)** – The amount of muscling is determined by feeling the width of the breast and back particularly over the loin region. The breast meat is the most valuable cut of meat on the meat chicken because it yields —white meat which commands the highest market price. The width of the loin is an indicator of muscling throughout the carcass much like the loin eye area of a beef steer or market hog. The thickness of bone also indicates muscling due to the fact that the more muscling an animal has the larger the bone must be to hold the muscle. Excessive bone is not desirable because of decreased dressing percentage. Range fed broilers will have longer legs than white hybrid broilers.

**Finish (20 points)** – Fat provides flavor and tenderness to meat. Adequate fat is desirable, yet excessive fat reduces feed efficiency, overall yield and dressing percentage. Pullets tend to fatten faster than cockerels due to the effects of the sex hormones estrogen and testosterone. Industry producers typically sex broiler chicks at day-old and separate them, providing specific rations for each, reducing concern for excessive fat.

**General appearance (20 points)** – As in other meat animal species, female chickens tend to offer more —eye appeal than males because estrogen causes a —rounder body structure, thus a —meatier and —youthful appearance in the live animal. Therefore, project members are encouraged to raise pullets as broilers rather than cockerels (unless the classes are for single males and single females). Pullet chicks are generally 10-12 cents cheaper than cockerel chicks as well.



## Desirable Market Factors

### Matching pairs or pen (10 Points)

Like other meat animals, broilers and sometimes roasters are shown in pairs. This exhibit is intended to determine if the exhibitor understands the basic principles of meat chickens. Pairs are intended to be matched as closely as possible. This means that they should appear as —peas in a pod.

A pair or pen exhibit simulates the industry's need for uniformity in birds that ultimately produce a uniform product that the consumer demands. The industry has uniform methods of processing millions of broilers and the consumer demands that each broiler or cut of meat purchased be identical to the previous.

The most confusing part of matching pairs of animals is the fact that a meat animal pairs or pens are **the same sex!** This exhibit should be either two (three) cockerels or two (three) pullets. Colored range fed broilers should be matched for color, but this is a very insignificant factor.

They should be nearly the same weight, have similar body structure, fleshing and finish. Matching a pair may be difficult when only a small number of birds are being raised. If one of the birds shows a disqualification or serious defect, both will be judged as a pink ribbon winner.

## Processing Meat Chickens



There are many good sources information on slaughtering and processing meat chickens. Read the information carefully. Ask questions of those who are experienced and perhaps set up a time with your project leaders to cooperatively process birds with other project members. Make sure you review and follow state laws before marketing your birds.

There are a number of custom slaughter plants that will process meat chickens, inspecting them for wholesomeness, making them available for commercial sales.

Promote your birds and market them so that you maximize the return on your project.

## Keeping Record

Your 4-H or FFA record books will help you to keep track of your poultry income, expenses and profits. Along with quality photos of yourself performing tasks and developing skills in your range fed chicken project you will be able to apply for achievement and proficiency awards.

Note: "The Chicken of Tomorrow" documentary film may be viewed at:

<https://www.youtube.com/watch?v=uPYYwdI0tIc>

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*Madison. This and all of my poultry publications are dedicated in recognition of the Poultry Science Department at the University of Wisconsin Madison who mentored me from the time I was 4-Her in Jefferson County, WI: Dr. Lou Arrington, Dr. Herbert Bird, Professor Roy Haller, Dr. Art Mauer, Dr. W. H. (Mac) McGibbon, Professor John Skinner, Dr. Milt Sunde, Dr. Bernard Wentworth as well as animal geneticist Dr. Richard Shackelford,*