

WHICH BIRD SHALL I RAISE?

Genetic Options for Pastured Poultry Producers: Meat-type Chickens and Turkeys

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December 2002

Introduction

Most pastured poultry producers in North America use the same Cornish-and-White-Rock-cross broiler genetics that are used by the conventional poultry industry. These are the standard meat birds used by the industry, and essentially all broilers produced commercially in North America are Cornish crosses.

This has been true since meat became a primary focus for chicken genetics in the 1940s and confinement-rearing became the standard form of production for the US poultry industry. A 1950s contest called The Chicken of Tomorrow encouraged the development of meatier birds. Cornish crosses became the birds-of-choice at that time. Since then they have been continuously genetically refined by the conventional poultry industry for rapid growth, efficient feed conversion, broad-breastedness, limited feathering (for ease of plucking), and other traits considered appropriate for rearing very large numbers of birds in confinement conditions.

However, most pastured poultry producers today use the Cornish crosses because they are readily available, not because they are ideally suited to rearing on pasture. Many of the characteristics which make the Cornish cross broiler strains good for industrial confinement production models are not well-suited for alternative production systems. Many pastured poultry producers perceive the Cornish crosses to have weak legs, excessive rates of heart attacks, a high incidence of congestive heart failure (ascites), poor foraging ability, poor heat tolerance, and other liabilities when raised on pasture. While most producers value their rapid growth rate, others find it unnaturally fast. In most pasture-based production systems, Cornish crosses usually produce a four-pound carcass by eight weeks of age. Keeping the birds longer than eight weeks and allowing them to get larger can contribute to even greater leg problems.

Many pastured poultry producers would like to raise birds which are better suited to range production than the Cornish crosses. Therefore, the purpose of this report is to identify the genetic options available to producers who do not want to use the conventional confinement production model.

This report was compiled for Heifer Project International's North America Program. Partial financial assistance for the preparation of this report was provided through a grant to Heifer Project International from the USDA's Southern Region Sustainable Agriculture, Research and Education (SARE) program (project number LS 99-105).

The Conventional Industry Dominates the Scene

Many pastured poultry producers would like to raise birds which are better suited to range production than the Cornish crosses, but their alternatives at this time are extremely limited. There are several different strains of Cornish crosses but there is very little difference in them. No other type of chicken which is widely available in North America produces as much meat as economically as the Cornish crosses. This economic fact makes it very difficult for producers to consider other breeds even though there is abundant variety in the poultry world (color photos and descriptions of many poultry breeds can be seen at: www.feathersite.com/Poultry/BRKPoultryPage.html#Chickens).

The primary breeding companies for broilers in the USA are Aviagen (which includes the formerly separate companies of Arbor-Acres, Ross Breeders, and Nicholas Turkeys), Cobb-Vantress (which now includes Avian Farms and is owned by Tyson Foods), Hubbard Farms, Peterson Farms, and Shaver Poultry. Most of these companies are multi-national enterprises and they dominate the world market for conventional broiler production as shown in the Table below.

These companies work constantly to produce genetic improvements in their breeding stock. They typically use a system of four-way crossing to produce the parents of the birds which are raised as broilers. They select and develop certain strains to use as their male line with emphasis on growth performance and body conformation, while at the same time developing different female lines with emphasis on reproductive performance. This cross-breeding system protects each company's genetic research investment, because the genetics of the original grandparents cannot be reproduced from their offspring.

World broiler production is estimated to be 32-42 billion birds per year.

Estimated market shares for the different broiler breeder companies:

(SOURCE: WATT Poultry USA)

Company	Percent
Aviagen	35-45
Cobb	30-40
Hubbard	10-20
Hybro	5-10
Other	10-20

Most of the primary breeding companies produce more than one strain of Cornish cross. They try to meet the needs of their customers by producing a heavier breasted bird for producers focused on white meat, a thriftier bird which has a slightly better feed conversion ratio, or a heavier strain for the roaster market. Some also offer slower and faster growing strains of Cornish cross birds. The slower growing strains may be of interest to pastured poultry producers because they may have fewer heart and leg problems.

The different strains of birds which the breeding companies offer are described at their web sites. Some of these sites also include technical manuals and guides for raising their birds.

- Aviagen <http://www.aviagen.com/>
- Arbor Acres <http://www.aaf.com/> (includes downloadable management guides)
- Ross Breeders <http://www.rossbreeders.com/> (includes technical manuals)
- Nicholas Turkeys <http://www.nicholas-turkey.com/>
- Cobb-Vantress <http://www.cobb-vantress.com/>
- Peterson Farms <http://www.petersonfarms.com/> (site under construction)
- Shaver Poultry <http://www.shaverpoultry.com/> (site under construction)

The breeding companies sell crossbred parent stock to the vertically-integrated poultry producers, independent hatcheries, and others who produce the hatching eggs which will ultimately become the broilers we eat. Most independent hatcheries do not keep their own flocks to

produce hatching eggs. Instead they buy their hatching eggs from a few very large suppliers (such as the Keith Smith company in Arkansas [<http://www.keith-smith.com/>] or CWT Farms in Georgia [<http://www.cwtfarms.com/>]). Therefore, the chicks available from hatcheries throughout North America are mostly all the same strains, and they are the same strains being used by the vast majority of the conventional industrial producers.

Producer Preferences

Even though the differences in the Cornish cross strains are small, some pastured poultry producers do have preferences. Over the years they may perceive that one strain performs better for them than other strains. These differences may be such things as fewer leg problems, slightly faster (or slower) growth, or lower mortality. Therefore, while most pastured poultry producers do not know exactly which strains they are raising from batch to batch, a few producers always try to purchase a particular strain of chick.

Yet even those producers who express a preference for one strain over others may have had their opinions unduly influenced by factors which are not related to the genetics of the birds they have raised. For example, the age of the breeder flock influences the size of the hatching eggs and the chicks which result. Young breeder flocks produce small hatching eggs and smaller chicks than mature flocks. Older flocks nearing the end of their productive lives also produce chicks with greater inconsistencies in their size and vigor than a flock at the prime of its life. Therefore, some producer preferences may not be objectively justifiable.

The Importance of Access

Because the performance differences between modern Cornish cross strains are so small, most pastured poultry producers use other criteria when deciding which birds to raise and where to get their day-old chicks. Through their own personal experience they have concluded that a hatchery's customer service and location are usually more important than the precise strain of broiler chick available. They have learned that they should get the birds from the most reliable hatchery that can get the chicks to their farm with the least shipping stress. Usually this means the hatchery which has the shortest delivery time. Death losses and slower rates of growth resulting from shipping stress are often more significant than the performance differences between strains. The importance of

shipping stress is also confirmed by the behavior of the major conventional industrial producers. They use their own employees and vehicles to deliver chicks directly to their contract growers; they try to control the shipping conditions which their chicks must endure as much as possible, and minimize their shipping stress. This is an argument for having more (rather than fewer) hatcheries, and having them located as near as possible to the producers who will raise the chicks.

Here are the websites of several hatcheries. These are not given as recommendations, but simply as examples of what independent hatcheries have to offer and how they present themselves. A more complete listing of hatcheries throughout the USA can be found at <http://www.aphis.usda.gov/vs/npip/> and at <http://www.poultryconnection.com/hatchery.html>.

Samples of Hatchery Websites:

- <http://www.belthatchery.com/> Phone: 559-264-2090
- <http://www.esteshatchery.com/> Phone: 800-345-1420
- <http://www.mcmurrayhatchery.com/> Phone: 800-456-3280
- <http://www.moyerschicks.com/> Phone: 215-536-3155
- <http://www.mthealthy.com/index.html> Phone: 800-451-5603
- <http://www.privetthatchery.com/> Phone: 877-774-8388
- <http://www.townlinehatchery.com/chicks.html> Phone: 616-772-6514

Shipping constraints beyond the control of the hatcheries themselves can be an important factor, as well. During the early and mid-1900s, the practice of sending day-old poultry by mail from hatcheries to customers all over the USA became very popular and commonplace. In recent years, however, the number of airlines willing to carry day-old poultry as US mail has declined, even to the point that the chicks-by-mail service appeared to be in jeopardy. Then in 2001 and 2002, the US Postal Service and several airlines modified their mail-carrying contracts and the regulations governing the shipment of live animals through the mail. These new arrangements have apparently stabilized the situation and the chicks-by-mail service continues. The latest information on the postal regulations governing the shipping of live animals as mail can be found by visiting the web site of the US Postal Service (<http://www.usps.com>) or <http://www.birdshippers.org>.

Other Decision Factors

Some pastured poultry producers also make decisions about which chicks to raise based on other non-strain factors. For example, some producers choose to raise all females because that eliminates the problem of cockerels harassing the pullets as they mature, thus resulting in a more tranquil flock, and presumably better feed conversion. Or they will raise all males because their customers want large birds, and they want greater uniformity in their product.

Uniformity is tremendously important for the conventional poultry industry. Birds are managed as a unit instead of individuals, and birds which are not nearly identical to the others are problems. For example, pullets are brought into lay at the same time, so they all need to achieve the appropriate body weight at the same time. For broilers, much of the conventional industry's processing equipment is automated and odd-sized birds may not be processed well because they are not the size the equipment is designed to handle. Variations in carcass size can also cause the automated equipment to break down.

Most pastured poultry producers do not seek this much uniformity, however, because their market does not require it. Using straight run chicks gives a range of carcass sizes at butchering time because the cockerels grow faster. Most pastured poultry producers are glad to have some variance in size because some of their customers prefer smaller birds and some prefer larger birds. Some will even choose to produce Cornish Game Hens (which are the same Cornish cross birds, just ones which are butchered younger and smaller), while other producers have customers who want very large roasters and are willing to pay a premium price for them. Uniformity certainly can become more important, however, as producers move beyond on-farm processing and direct marketing. A spread-out harvest which is advantageous on a small scale may become a distinct problem at larger scales of production.

Some customers prefer colored birds (red or black) over white-feathered ones. This kind of preference also influences producer decisions about which birds to raise.

Beyond Cornish Crosses

North American producers of range poultry who want options other than those offered by the conventional Cornish crosses do not have very much to choose from at present. Their options may be increasing, however.

For several years now, Timothy Shell and his family in Virginia have been raising parent stock on pasture to produce offspring which are healthier and hardier than typical chicks from confined breeders. They call their chicks "Pastured Peepers." The Shells have also been working to develop a line of broilers, called CornDel (a combination of Cornish cross and Delaware), which is better suited for pasture-rearing than the conventional Cornish crosses. These slightly slower-growing birds should reach four-pound carcass weights in nine weeks. For more information, contact:

Tim Shell
407 Mt. Solon Rd.
Mt. Solon, VA 22843-9718
540-885-4965
tshell@firstva.com

Others are also working to make medium-growing genetics more widely available in North America. Henry Noll offers a Silver Cross that grows to five pounds live weight in nine weeks.

Noll's Poultry Farm
Kleinfeltersville, PA 17039
Phone: 717-949-3560
Fax: 717-949-3722

And Joe Cebe, Sr. offers a Cebe Red and Cebe Black meat variety that grows to five pounds live weight in nine to 10 weeks.

Cebe Farms
P. O. Box 1404
Ramona, CA 92065
Phone: 760-789-8221

Matt John of Shady Lane Poultry Farm, Inc. is currently developing a new hatchery and plans to introduce several alternative broiler lines over the next several years.

Shady Lane Poultry Farm, Inc.
520 Agawam Road
Winchester, KY 40391
Phone: 859-737-2636

Some genetic options exist in other countries. In France, in particular, there are lines that are considered more suitable for their range production systems. These lines have been developed for the past 30 years for pasture rearing, and they deserve side-by-side comparison trials here in the USA.

These distinctive lines are used primarily by producers who are raising birds to be marketed under the quality labeling program known in France as *Label Rouge* (Red Label). Food products carrying the *Label Rouge* are highly valued by French consumers.

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* poultry and conventional poultry—in fact, regular taste-testing is a certification requirement to prove that these products are “vividly distinguishable” from conventional poultry.

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

Slow-growing birds are key in *Label Rouge* production—birds grow to five pounds live weight in 12 weeks. In comparison, the fast-growing broilers (Cornish cross) of the conventional industry reach five pounds in six to seven weeks. The slow growth allows the organs, muscle, and bones to grow in harmony. 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 standard Cornish crosses.

The use of slow-growing genetics and the low-density *Label Rouge* production system also offers distinct health advantages—ascites, leg problems, and sudden death are minimal, and birds have good immunity. Mortality for conventional broilers in France is 6% during a six-week grow-out; it is half that for *Label Rouge* production (3%) even during a much longer grow-out (12 weeks).

In Europe the slow-growing genetics are mainly supplied by the poultry breeding companies SASSO (www.sasso.fr) and Hubbard-ISA (www.hubbard-isa.com). They do not sell the actual broiler chicks, but rather the parents; however, many pastured poultry producers have hatching capability. SASSO's typical *Label Rouge* cross is T44N male x SA51 female. (Using a different male—the T44NI—results in white under feathers in the offspring.) A typical Hubbard-ISA cross is S77N male x JA57 female. Broilers from both of these crosses will have red feathers, yellow shanks, thin skin, and a naked neck. Other parents are available for broilers with white feathers and skin, black feathers, barred, non-naked neck, or for faster growth. These color combinations are possible because the female parents are red in color, but this color is recessive. Therefore, depending on the male used, you can choose the color of the feathers (red or black), skin (yellow or white), shanks (yellow or white), and naked neck or not. The ability to choose these characteristics is important to French poultry farmers because their customers have personal preferences about these things.

At the time of this writing, SASSO and Hubbard-ISA genetics of this type are not available in the USA. However, a U.S. company called Rainbow Breeding Company is developing similar genetics and offers Free Range (FR) Broiler parents. FR Broiler offspring (day-old chicks) are also available. Male chicks are regularly available; female chicks are available only occasionally since they are used more in breeding; females grow at 85% the rate of the males.

Rainbow Breeding Company
c/o Richard Udale
P. O. Box 911
Gentry, AR 72734
479-685-6349 cell

Email: cowboy_richard@yahoo.com Or, contact Danny Eiland at 205-389-3466 (dceiland@hiwaay.net).

Redbro is a Hubbard-ISA Shaver product that is currently available in the USA via a Canadian company that imports parents from France. It grows out in 9-10 weeks. Jerry Srednicki at a Connecticut hatchery ships day-old chicks.

Yankee Chicks, Inc/Hall Brothers Hatchery
P. O. Box 1026
Norwich, CT 06360
Phone: 860-886-2421
860-889-6351 fax
860-608-1389 cell
Contact: Jerry Srednicki

Importing live birds and hatching eggs from other countries is not a simple task, but those who are interested in pursuing this approach can learn more by visiting the web site of the National Poultry Improvement Plan: <http://www.aphis.usda.gov/vs/npip/>

There is also some interest in using standard American heirloom chicken breeds for gourmet poultry production. In general, however, heirloom breeds have not yet been selected for commercial production and the carcass will be very small at 12 weeks. For more information about the American heirloom breeds, contact:

American Livestock Breeds Conservancy (ALBC)
P. O. Box 477
Pittsboro, NC 27312
(919) 542-5704 FAX (919) 545-0022
www.albc-usa.org

Turkeys are native to the Americas and there are several slow-growing breeds available. These are naturally-mating turkeys and do not require artificial insemination. Some have geographical ties to the regions in which they were developed (e.g., the Bourbon Red is from Kentucky and

the Narragansett is from Massachusetts). Mike Walters Hatchery offers eight heirloom turkey breeds, some of which have been selected for commercial production. Contact Mike Walters at

Walters Hatchery
Rt. 3, Box 1490
Stilwell, OK 74960
Phone: 918-778-3535
Email: turkeylink@intellex.com
<http://www.historicalturkeys.com>

Developing more poultry breeds with geographical ties could be an opportunity for small North American poultry breeders.

For more information on poultry genetics, contact: Anne Fanatico
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