

Department of Animal Science

GROWING CHICKENS FOR SHOW

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Poultry projects are popular with 4-H and FFA members and are an integral part of many youth livestock shows across the country. The 4-H Chick Chain project is designed to teach 4-H members recommended care and management practices for the family laying flock. Many Tennessee farm families who keep hens for egg production may not have adequate year-round production due to improper management practices. The 4-H Chick Chain project provides youth the opportunity for hands-on experience in the areas of poultry management, health, nutrition, biosecurity, as well as developing business and record keeping skills. The Chick Chain can be a fun and rewarding experience but be aware it requires an extra commitment of time, patience, dedication and concern for the animals involved to properly raise and care for a flock of chickens. This publication offers advice on what is involved in caring for a flock and producing winning chickens for show.

Management Program

Preparing for your chicks

It is vital to have everything ready **before** your chicks arrive. This includes proper housing, adequate temperature, feed and water, and adequate lighting in place before the chicks arrive. The first two weeks, from hatch to 14 days of age, is the most critical period in the life of your birds, and your management skills must be at their best during this period. You will be the mother hen during this time, and the chicks will be dependent on you for everything. As they age, they will become better able to take care of themselves, however, during the first two weeks they are dependent on you for feed, water, proper temperature and ventilation, lighting, predator protection and adequate housing. Prize-winning birds at show have caretakers that follow four essential steps:

- Provide your birds with housing and environment that is conducive for growth and development,
- Feed the proper diets in adequate amounts that meet all the bird's nutritional needs,
- Carefully select the birds with the best potential to win and,
- Keep adequate records to track your bird's growth and expenses.

Let's consider housing and environment first.

Housing and environment

Do not think that the housing and equipment you use to raise your birds must be fancy or expensive because expensive housing is not necessary. Many prize-winning birds have been grown in a small area in a barn, storage shed, or outbuilding. While it does not take expensive facilities, it does take adequate planning and preparation of those facilities before the birds arrive to help them adapt to their new environment as soon as possible with a minimum amount of stress. Adequate housing must provide the birds with sufficient space, plenty of ventilation, proper temperature (regardless of the season), and protection from the elements and predators. Always keep in mind that, while good housing, environment and adequate feed which meets the nutritional needs of the bird are critical for the rapid growth of your flock, poor management or bird care on your part can overshadow and offset good facilities and feed and undermine all your previous efforts, leading to decreased animal welfare and poor performance. Checking your birds multiple times each day, especially during times of changing temperatures and to monitor feed and water availability, and making adjustments accordingly, is a critical requirement on your part to ensure that the proper environment is maintained at all times and to protect the health and welfare of your chickens.

As a good flock husbandry person, you will become familiar with each of your individual birds by watching and listening before you disturb them. You will soon recognize that each one will be unique with its own mannerisms and personality similar to people. Happy and contented chicks are often very active and exploring while chirping softly, while uncomfortable or sick birds vocalize loudly, huddle together or act lethargic and listless. Do not overly tire new chicks (0 to 6 days of age) with excessive handling as this can increase their stress level and make them more susceptible to stress-related disorders. Baby chicks require longer and more frequent rest periods than adult birds. A good rule of thumb is to provide baby chicks a minimum of two consecutive hours of undisturbed rest four times a day followed by eight to ten hours of undisturbed nighttime.

Optimum housing can be its own unique structure that is fully enclosed to avoid dramatic temperature fluctuations and precipitation (rain, snow, etc.) as weather conditions change and has openings for ventilation and natural lighting. Again, housing does not have to be expensive or complicated. Numerous exhibitors have successfully raised prize-winning show birds by creating a simple pen in the corner of a barn, garage, or workshop. This arrangement will work fine as long as you can control temperature, lighting, and ventilation. Prepare the pen at least two days before baby chicks arrive. Use a heat lamp or other heat source to warm the pen and litter before the chicks arrive.

Put at least four inches of litter on the floor of the pen. Kiln-dried pine shavings, rice hulls, or dry sawdust all work well as litter choices. Hay or wheat straw are not the best litter choices because these materials do not absorb moisture well and tend to mat together and compact, which you do not want. You want litter material to remain dry, loose, and friable to help improve the welfare of your flock, provide a cushion for the feet and breast of the birds, and not encourage the birds to eat the litter material. Litter or bedding material should not be a source of disease. Litter that is wet, moldy or dusty can lead to respiratory infections and in some cases, death. Litter moisture levels should be in the 20 to 30 percent range. You can determine if the litter is becoming too wet by squeezing a handful of litter material. If the material sticks together in a ball or clump in

your hand upon squeezing, it is too wet. It should then be diluted or replaced with dry litter material.

The proper environment is just as critical as adequate housing. During the early brooding period (first seven days), take every precaution to avoid chilling your chicks. The brooding temperature should be at 92 degrees F the first week. If your pen is large, build a brooder guard to keep chicks near the heat, water, and feed. When the chicks are seven days old, remove the guard and allow them access to the entire pen. If chicks tend to huddle in the corners once the brooder guard is removed, securely fasten cardboard or other material to round off the corners and prevent this behavior. Watch your chicks closely the first few days. They will tell you by their behavior whether environmental conditions are ideal or not. When temperature conditions are just right, the birds are said to be in their “thermoneutral zone,” where they expend the minimal amount of energy to stay warm or cool themselves. This is what you want. When the birds are using the smallest amount of energy from the feed to maintain their ideal body temperature, they are using the maximum amount of feed energy for growth and development.

If the outside temperature is higher than the thermoneutral zone, your birds will use energy trying to stay cool and may become heat stressed. If the outside temperature is lower than the thermoneutral zone, birds use feed energy to stay warm and maintain body temperature and may become chilled. Using feed energy to stay warm means your birds will eat more feed but growth will not be as efficient. Birds, particularly broilers, seem to be at their most efficient when at a temperature on the low end of the thermoneutral zone. Keep in mind that the thermoneutral zone decreases as your birds age and increase in body weight. If your birds are huddled under the heat source or huddle together in groups, the temperature is likely below the thermoneutral zone, and the chicks are chilled. If birds are all near the edge of the brooder guard or pen, the temperature is likely above the thermoneutral zone, and they are searching for a cooler location. If they are scattered in small groups or as individuals throughout the pen space, they are likely in their thermoneutral zone.

Table 1 provides estimates for desirable temperatures at various ages. Baby chicks are not good at regulating their own body temperature. However, as the birds age, they develop the ability to regulate their internal temperature and require less and less supplemental heat as they get older. Because supplemental heat will be needed for at least the first week, place the feed and water **near but not directly under** the heat source. If feed and water are too far from the heat source, the chicks may become chilled and not find their way back. If feed and water are directly under the heat source, they can easily become too hot for the birds to consume. If the feed and water feel warm when touched to your wrist, then they are likely too warm for the birds to consume. The importance of temperature cannot be overemphasized. Do not overheat or chill your birds. If they are too hot, they will become heat stressed and eat less feed, restricting growth. Conversely, chilling can stunt the birds and increase their susceptibility to disease.

Table 1. Temperature guidelines chickens at various ages.

Age (days)	Temperature (F)	
	Day	Night
0-4	90	92
4-8	88	90
8-14	85	87
14-21	80	82
21-28	75	77
28-35	70	72
35-on	70	70

Relative humidity is just as critical as temperature, particularly for older birds. High environmental temperatures combined with high relative humidity (RH) is a dangerous environment, especially in birds over three weeks of age. Birds do not sweat and must rely on their respiratory system for individual evaporative cooling. If outside RH is high, your birds become unable to lose the heat-laden moisture off their respiratory system because the outside air is almost as saturated as the air the birds are trying to respire. As a result, they are working very hard to cool themselves but accomplishing very little. Prolonged exposure to these types of conditions can result in a reduction in weight gain and performance which will never be overcome. The ideal RH for birds is 50 to 60 percent. When outside temperatures are greater than 90 degrees F combined with RH greater than 65 percent, your birds will decrease or cease feed consumption, increase water consumption, spread out on the floor of the pen, lift their wings to increase heat loss, pant and become listless or lethargic. While heat stress can occur even in baby chicks, it is often the larger, heavier birds that are most susceptible, with heat prostration and death loss a real concern if adequate ventilation and cooling is not provided.

Provide 24 hours of light for the first week to help your birds adjust to their new surroundings and make sure they know where the feed and water sources are located. After the first week, you may want to provide one hour of darkness as a defense mechanism. That way, if the power should fail and the birds are in total darkness, they will be used to darkness and will not panic and pile on each other and possibly smother. Competition birds perform best when given as many hours of light as possible to access feed and water whenever they choose.

Feeding

While preparing for and providing the proper housing and environment for your birds is important, there is likely nothing more important than supplying adequate amounts of the most appropriate feed so that the birds can maximize their full genetic growth potential. Today's modern genetic strains of broilers and layers are remarkable in their ability to achieve rapid growth, high egg production and excellent feed conversion. However, these high-producing genetic strains have very high nutritional requirements and cannot overcome poor or less-than-adequate diets and still reach their genetic potential. Modern genetic strains with high potential can achieve remarkable feats but must have everything they need in the way of nutrients and environment. Otherwise, performance and animal welfare will suffer and genetic potential will never be met.

Optimum performance depends on proper nutrition. Keep feed available to your birds at all times. It is critical that all birds be able to eat at the same time. Chickens quickly establish a pecking order, and the dominant birds will prevent the more timid birds from having access to feed if feeding space will not allow all birds to eat at the same time. Modern genetics make it essential that your birds receive a high-quality poultry feed containing **at least 21 percent** protein. More than this is better. Anything less will not satisfy the nutrient requirements of today's genetics for maximum growth. Birds grow their fastest when they are young and maintenance needs are less, allowing most of the feed energy to go for growth. As the bird ages, growth rate begins to slow, allowing protein needs to decrease while energy needs increase and accounting for the fact that the bird must now not only continue to grow but also maintain the tissue that it has already created.

Therefore, many exhibitors now start their broiler chicks on a high-protein (26 to 31 percent) gamebird starter diet for the first seven to 14 days to optimize growth. They then switch to a broiler starter (24 to 26 percent) for the next two to three weeks, and then switch again to a broiler finisher (21 to 23 percent protein) ration for the remainder of the feeding period. Layers are often fed a starter diet (20 to 22 percent protein) for the first six weeks, switched to a grower (16 to 18 percent protein) or developer (14 to 16 percent protein) feed (depending on what your feed supplier may carry) after six weeks and then switched to a layer diet (15 to 19 percent protein) when pullets are 18 to 20 weeks old and near the start of egg laying. Do not feed layer diets to growing chickens. Layer diets contain extra calcium, which is needed for eggshell production but can be harmful to non-laying chickens.

You must provide enough feed to supply adequate and balanced levels of protein, fat, carbohydrates, calcium, phosphorus, vitamins, minerals and salt. The most common mistakes made in feeding birds for show are 1) feeding the wrong feed and 2) not feeding enough of the right feed. Do not feed your chickens scratch grains or table scraps. Scratch grains are low in protein. By diluting your complete commercial ration with scratch grains, you reduce the protein level as well as the vitamin and mineral content of the diet. As a result, the birds will not grow as well, they will be less resistant to disease, and the birds may begin to pick and eat feathers to compensate for the missing protein in the diet. Feather picking often leads to cannibalism in the flock. Chickens are capable of eating more feed than you might think. Expect each dual-purpose type pullet to eat about 18 to 20 pounds of feed from hatch to 20 weeks of age. A modern meat-type broiler chicken can eat about 18 to 20 pounds of feed in nine weeks. Table 2 from the National Research Council (NRC) provides estimates of typical body weights and feed requirements for broiler chickens. Be aware the figures are from 1994 and today's modern broilers consume more feed than what is listed in the table. The NRC is currently revising the Nutrient Requirements for Poultry Handbook. Table 3 lists approximate feed consumption of confinement-reared pullets. These figures are from 2006, and today's pullets likely consume more feed than what is listed in the table.

Table 2. Typical body weights and feed requirements of broilers¹.

Age (wks)	Body weight (lbs)		Weekly feed consumption (lbs)		Cumulative feed consumption (lbs)	
	Male	Female	Male	Female	Male	Female
1	0.34	0.32	0.30	0.29	0.30	0.29
2	0.83	0.76	0.64	0.60	0.94	0.89
3	1.51	1.36	1.07	0.98	2.01	1.87
4	2.39	2.13	1.55	1.42	3.56	3.28
5	3.47	2.96	2.12	1.63	5.68	4.91
6	4.60	3.84	2.52	2.21	8.19	7.12
7	5.71	4.71	2.82	2.38	11.02	9.50
8	6.78	5.52	3.16	2.47	14.18	12.07
9	7.83	6.27	3.48	2.75	17.65	14.82

¹Adapted from *Nutrient Requirements of Poultry: Ninth Revised Edition, 1994*.Table 3. Approximate feed consumption of confinement-reared pullets (commercial egg-type pullets)¹.

Weeks of Age	Pounds of Feed per Bird per Week	Accumulative Feed Consumption (lbs) per Bird
1	0.18	0.18
2	0.25	0.43
3	0.36	0.79
4	0.50	1.29
5	0.55	1.84
6	0.60	2.44
7	0.68	3.12
8	0.76	3.88
9	0.82	4.70
10	0.88	5.58
11	0.95	6.53
12	1.05	7.58
13	1.11	8.69
14	1.14	9.83
15	1.20	11.03
16	1.20	12.23
17	1.21	13.44
18	1.22	14.66
19	1.23	15.89
20	1.28	17.17

¹Adapted from *Wooley (2006)*

It is important to stimulate your birds to eat throughout the day. Training your birds to eat numerous small meals throughout the day is often the best course of action to achieve maximum growth. You can start this from the day you receive them and be consistent up until show time. Training them to be meal eaters can be as simple as shaking the feed container multiple times each day or adding a slight amount of new feed to their feed supply. This will make them curious and encourage them to eat each time you visit. You don't want to add so much that they waste feed, but any new addition of feed will cause them to eat. Move in a quiet, calm and consistent manner, and the birds will not be frightened, or if so, not for long once they learn that your visits mean fresh feed. Your frequent visits and stirring of the birds will soon teach them to eat several meals a day, each time you visit.

Water

No nutrient is more critical or important to your birds than water. Keep plenty of fresh, clean water available at all times to encourage feed intake. Feed and water are tied closely together. The availability of one affects the intake of the other. Fountain drinkers or nipple drinkers work well. Nipple drinkers are cleaner and easier to maintain than trough or fountain drinkers and tend to keep the litter drier and promote bird health. Water temperature also can be important, particularly with very young or older birds. Use water at room temperature when filling drinkers for baby chicks. Cold water can easily chill small chicks and cause them to huddle and restrict their search for food or prevent them from returning to the heat source. Once they are larger and fully feathered and the target temperature is nearer 70 degrees F, tempering will no longer be needed. However, providing larger birds with cool water when summer temperatures are high can help reduce heat stress.

Biosecurity

Keep all other poultry away from your broilers or layers. Good biosecurity is absolutely critical for the protection of your flock. This includes a good rodent control program. Rodents carry many diseases and can be a threat to your flock. Look for rodent holes and signs of droppings as you inspect your flock. Clean up any feed spills immediately to prevent inviting rodents to a free meal. Biosecurity includes any and all practices and protocols that you have in place for the prevention of disease in your flock. Biosecurity consists of three critical components:

- **Isolation**
 - Confine your birds within a controlled environment.
- **Traffic control**
 - Control who visits your flock; know who comes and goes and why.
- **Sanitation**
 - Disinfect material and equipment you use; consider disposable footwear and hand sanitizer for anyone who visits your birds.

There are two main pathways of disease transmission: 1) direct transmission – physical contact between infected and healthy birds, and 2) indirect transmission – disease agent is carried to susceptible birds by:

- Humans (likely the #1 threat)
- Contaminated feed
- Contaminated water
- Environment

- Shared equipment or tools
- Rodents or other vermin
- Pets

There are numerous possible disease signs to look for in poultry that may indicate a disease situation. These include:

- | | | |
|----------------|--------------|---------------|
| ○ Sneezing | ○ Decreased | ○ Decreased |
| ○ Coughing | feed and | fertility and |
| ○ Swollen | water intake | hatchability |
| sinuses | ○ Misshapen | ○ Huddling |
| ○ Nasal | eggs | ○ Lethargy |
| discharge | ○ Decreased | ○ Increased |
| ○ Watery eyes | egg | mortality |
| ○ Twisted neck | production | |
| ○ Dehydration | ○ Depression | |

Keep things in perspective and realize that chickens are farm animals and belong outside like cows and hogs, not inside the home like cats and dogs, especially not in the kitchen. Salmonella outbreaks occur annually in the US, and these outbreaks are sometimes traced back to backyard poultry. Salmonella is common in backyard poultry, and, while it may not make the chickens sick, it can make their caretakers and anyone else that comes in contact with the bacteria sick. If chickens are brought inside, the bacteria can remain behind on couches, carpets, and countertops long after the chickens are back in their pen. What should poultry keepers do and not do to protect themselves?

- DO NOT kiss and snuggle backyard poultry.
- DO NOT eat or drink anything around your birds.
- DO NOT touch your mouth after handling your birds.
- Always wash your hands with soap and water immediately after handling backyard poultry or anything in the immediate area.
- Adults should supervise activities and handwashing of children.
- Children younger than five should not handle backyard poultry. These children are more likely to unknowingly put their hands in their mouth before mom or dad or grandma or grandpa has a chance to help them wash their hands.
- Keep hand sanitizer near the coop and use it.
- Be aware that children younger than five, adults older than 65, and people with weakened immune systems are at greater risk for serious illness from diseases spread between people and poultry.
- Handle eggs carefully
 - Collect eggs often (eggs left in the nest for long periods become cracked and dirty).
 - Throw cracked eggs away (germs can easily enter the egg through a cracked shell).
 - Refrigerate eggs to keep them fresh and slow the growth of germs.
 - Cook eggs until the yolk and white are firm; egg dishes to 165 degrees F.

Make sure you purchase your chicks from a source that participates in the National Poultry Improvement Plan. This is your assurance that the supplier is doing everything possible to ensure

your chicks are healthy and disease-free. Common sense, good biosecurity and proper hygiene will help minimize the disease threat. Backyard poultry offer many benefits. These benefits are more enjoyable when everyone stays healthy.

Internal and external parasites

Parasites are a threat to the successful raising of chickens. Managing parasites is crucial for the health of your flock. The most common types of internal parasites are roundworms, cecal worms, and tapeworms. Capillary and gapeworms also are found from time to time. Each type can negatively affect the health of your birds. If you notice your birds being lethargic, having unexplained weight loss, or flushing/pasty vents (having diarrhea) these could be signs of internal worms, and they should be treated using a dewormer. Fenbendazole (sold as Safe-Guard AquaSol for poultry) is the only product that is currently approved for treatment and control of roundworms and cecal worms in chickens and turkeys in the US. The most common types of external parasites for chickens are poultry mites, poultry lice, bed bugs, and fleas. These types of parasites are small but can be seen by the naked eye, often around the skin near the vent. If you notice your flock having external parasites, they should be treated immediately to avoid loss of performance. Treatment can be achieved using insecticide/miticides on the birds and premises. The life cycle of external parasites may make it necessary to treat multiple times. Insecticides/miticides work against the parasite but not against the eggs. Therefore, multiple treatments may be necessary to control parasites that hatch after the initial treatment. Regular observation and timely treatment are essential components of effective parasite control (Miller et al., 2017).

Culling and selection

Become a bit hard-hearted and cull hard during the entire growing period up until showtime to optimize performance. Understand that small, sick, stunted or deformed birds will never be show quality material and should be removed. At around four weeks of age, reduce the flock size by removing any small, poorly fleshed or deformed birds. Keep two or three birds for each one you will need for the show that you can choose from later. Reducing the flock size will have numerous benefits including increasing floor and feeder space per bird and reducing stocking density and social pressure, leading to improved fleshing, uniformity, and finish on the birds that remain. In addition, reducing the flock size will mean fewer birds to feed, which will reduce the feed bill.

Winning characteristics differ depending on whether broilers or layers are being judged. Pigmentation, abdominal capacity, vigor and vitality, and head parts govern the placing of egg type pullets while the largest, heaviest birds with the most breast meat are generally what the judge looks for in broiler chickens. When selecting your birds for the show, if you need a group of three, make each bird as near a carbon copy of its pen mates as possible. If you have one bird that is much better than all the rest, leave that bird at home. Choose three that, while perhaps not your best bird, are almost identical clones of one another. Uniformity is one of the things the judge will look for. Consider conformation as well (the skeletal system or shape of the bird). Look at the length, width, and depth of your birds. More is better but pick three birds that are as identical as possible in length, width and depth. The breastbone should be straight, long, and free from defects, carry well forward and back between the legs parallel to the backbone. The back should be wide with a broad spring of ribs. The body should be full and deep. Eye appeal is part

of the overall package so carefully examine birds headed for the show for any physical defects that might lessen their eye appeal such as cuts or tears to the skin, bruises, broken or disjointed bones, external parasites (lice, mites), or insect bites to the face, comb, or wattles.

Record keeping

While record keeping will not likely be the most fun part of your Chick Chain experience, it will be one of the most valuable as you look back on this year's project and look ahead to next year's project. The records you keep will be your starting point as to assessing which decisions you made that were right and which ones you may need to reconsider for next year. Did you use the correct feed? Did you feed your birds enough? Did you provide adequate housing? Did you lose birds to predators? Did your birds stay healthy? Documenting the management decisions you made and the results of those decisions from this year will help you improve the management of your birds next year. A daily or weekly dairy will help you become a better caretaker and manager in the future. Include information such as housing particulars (time and money spent, style, etc.), predator losses, high and low temperatures, feed intake, feed costs, weight gains, time spent with your birds and flock mortality rate.

Measuring your success

A Chick Chain project comes with much responsibility but also is an exciting and rewarding experience. Management practices outlined in this publication can help you achieve success. Following a few specific guidelines can put you on the right track for growing prize-winning poultry.

- Provide adequate amounts of the proper feed.
- Maintain proper ventilation (especially during high summertime temperatures).
- Maintain a comfortable temperature range.
- Never allow your birds to be without feed and water.
- Maintain a strong biosecurity program to keep your birds healthy.
- Keep the litter in good condition (dry, loose, friable).
- Cull small, stunted, sick or deformed birds from the flock.
- Most importantly, have fun and enjoy the experience.

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