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GUIDE TO BACKYARD CHICKENS

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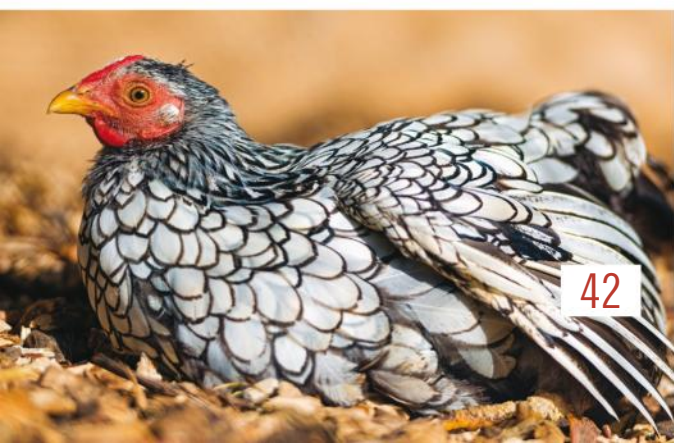
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*As compared to typical store-bought eggs per USDA National Nutrient Database. See website for full details.



Featured Comments

“Our rural postal carrier even took (the chicks) out of the box, put them under the heat lamp, and made sure they all had a drink!”

—Suzanne Weber, via Facebook, on “Inside Look at a Hatchery”

“A few things to know about guineas: They’re great tick and all-around bug eaters. ... They are great farm yard guard dogs. They sound the loudest most annoying alarm to ward off and run off predators ... They are dumber than a bag of hammers. They can fly, and very well might. But then spend a whole day running a fence line trying to figure out how to get back over it. We have about 25 and love them.”

— Shellie McClish, via Facebook, on “Great Guide to Guinea Fowl” podcast

Community Chickens

Thinking of raising chickens? Check out Community Chickens, a web community of chicken keepers, novice and experienced, with lots of tales to share. Learn something new every day. From treats to coops, from hilarious moments to DIY projects, you’ll find something to help you on your journey at www.communitychickens.com. You’ll feel right at home.

Send Us Your Photos

Do you keep a flock of chickens? Do you have some great shots of your chickens in the yard? We would love to see some images of your animals, your coops, your chicken yard. Send us photos and a few details about your chicken experiences. Send them to jteller@ogdenpubs.com, and it may be featured on our social media platforms or in a future issue of the magazine.

Homesteading Bloggers

We invite chicken keepers, country living folks, do-it-yourselfers, and country cooks to join the GRIT online community and become a GRIT blogger. We’d like you to write about your experiences, good and not so good, and your know-how, and share it with other aspiring homesteaders. Send an email to asarkesian@ogdenpubs.com for more details and to get started.

58% of GRIT readers raise chickens

98% of readers raise chickens for their eggs

75% free-range their flock

Join the Conversation

On “Beat the Heat, Helping Chickens Survive High Temperatures” by Kathy Mormino

“I have watermelon waiting to freeze for the girls! And I love the idea of adding frozen jugs to a shady spot for them! We have great tree coverage in the summer time so our chicken area stays not too hot except for those days where no one is safe from the heat! We have lots of spots that are under things like a porch and a shed. Under the shed stays cool ALL the time.”

—Yssa Mahoney, via grit.com

“Great article. I tried a mister but it seemed like my chickens didn’t like it. However, they don’t like any changes, so I’ll keep trying. Maybe turning it on for awhile and then turn it off?”

—Pam Baum, via grit.com

“Pam, you’re 100-percent correct that chickens dislike change. I would turn it on and leave it on, they’ll get used to it and even if they don’t dance around underneath it, it is still helping to make cool puddles that they can walk through, which will help them cool off.”

—Kathy Mormino

“I worry about the heat in combination with the humidity here in North Carolina! I keep chopped veggie scraps in the fridge to give the girls as a treat and to cool them down.”

—Esther Widgren

“Great idea, Esther. Heat and humidity are a major concern here in New England too, which is why I thought it so important to share all I’ve learned about helping my chickens in the summer.”

—Kathy Mormino

“I never knew that panting chickens means immediate action required ... so good to know this. I just thought they panted like dogs! I am certainly going to try some of the suggestions for cooling them down.”

—Elisha Hutchinson

“I used small silicone loaf pans and blended up leftover strawberries and a hand full of freshly picked mint with water and froze it.”

—Sandy Abell

Reader Blogs

GRIT is proud to offer blogs written by our readers from across North America. If you would like to become a GRIT blogger, email asarkesian@ogdenpubs.com for more details.

An Introduction to Working Chickens

By Lindsay

“When it comes to keeping chickens, you’ll hear all about how they eat things they aren’t supposed to and that they poop a lot! It’s true, and it can be very frustrating. Here at Haven Homestead, we’ve experienced several iterations of chicken habitat and systems. We’ve learned a lot of lessons from each period. The main lesson ... is that you need to put your chickens to work!” — from Haven Homesteaders for GRIT

Lindsay and her husband recently began their adventure in homesteading, and they are learning new things every day. This is the first in a series of posts on chickens.



So You Want Backyard Chickens, Huh?

By Susan Berry

“When I started my blog and Facebook page for Itzy Bitzy Farm I stated in my profile ‘Our goal is to share our successes and failures. ...’ Now, I have persevered because I adore having chickens. I cannot imagine my life without them. ... I have had to swallow my pride and admit with even all my research, I have made mistakes, miscalculated and just done silly things in my first year as a chicken owner. But I took lots of time and thought for many, many, many hours about my commitment to the proposition. I weighed the positives against the negatives and made my decision based on my own personal lifestyle and truthfulness with myself.” — from Humble Homestead

Susan and her husband farmed 2 acres in North Carolina before returning to Massachusetts and are now homesteading on less than a quarter of an acre .



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Of GRIT Readers Who Keep Chickens

43 percent raise Buff Orpingtons
42 percent raise Rhode Island Reds
42 percent personally process chickens for meat
79 percent prefer brown eggs
31 percent raise between 6 and 10 chickens



Become a GRIT blogger. Email asarkesian@ogdenpubs.com for details.



Benefits of Backyard Chickens

Former Contributing Editor Robin Mather explains the many benefits to keeping backyard chickens. Not only will you get delicious eggs on a dime, you'll have access to free fertilizer, organic pest control, hormone-free meat, and the simple joys of watching your chickens roam the yard. Go to bit.ly/2kZL70j for the video.



Egg Production

Supplement your diet and grocery budget with fresh eggs from your backyard poultry flock. Ensure your laying hens receive a balanced diet for the most nutritious eggs. Hank and Purina animal nutritionist Dr. Gordon Ballam talk tips for keeping hens in top laying condition at bit.ly/2kZxdv4.



Feeding Chickens a Balanced Diet

A balanced diet is important for all livestock, including your backyard chickens. Depending on their purpose – whether it's meat, eggs, or both – your chickens need specific nutrients in the right amounts to be as productive as possible. Watch the video at bit.ly/29Tn6BE for tips on finding the proper feed for your flock.



Gardening with Chickens

Chickens make great gardeners; while scratching for bugs and other goodies, they till the soil and help ready an area for planting. They also provide manure for great compost. While rabbits are not welcome additions to your garden, they, too, provide manure that helps you create a garden to remember. Watch Gardening with Chickens here: bit.ly/2hmjj7c.



Preparing for Chickens

Be sure you are ready for your first batch of chicks when they arrive. Hank Will and Purina animal nutritionist Mikelle Roeder walk you through the checklist of things you'll need in this video, bit.ly/2jCvP4G. Learn how to set up a brooder, what temperature to keep it at, and more to successfully raise your flock of chickens.

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Your Backyard Chickens

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Page 8, clockwise from top right: Blair Prenoveau put out fresh milk for the flock; Larry Stephens is up close and personal with his American Dominique roo; Kellyanne Truesdale's hen, Norma Jean, taking a break; Wendy Ogden's daughter, Emily, with hen, Peggy Sue; Jade Baxter's Silver Crested Polish named Crush; John Grinnell shares a photo of chickens on his brother's farm. Page 9, clockwise from above: Mary Douglas' Light Brahma hens at feeding time; Ailee Farey shows off her little ladies; Tauna Pierce's Rhode Island Red rooster is a proud and protective father; Monique Conklin's chicks consider the rind of half a watermelon to be a suitable place to hang out; Jake Kristophel's brand new Buff Laced Polish; Sharil Meeks caught her rooster, Sonic, putting on a show; Leeann Coleman's rooster is named Lucky for making it past "freezer camp."



Chicken Keepers Share EXPERIENCES

From harvesting meat chickens to building a brooder box, from feed to molting, experts offer tips and advice to the newbie.

Making the Ultimate Brooder Box

By Kirsten Lie-Nielsen,
HostileValleyLiving.com

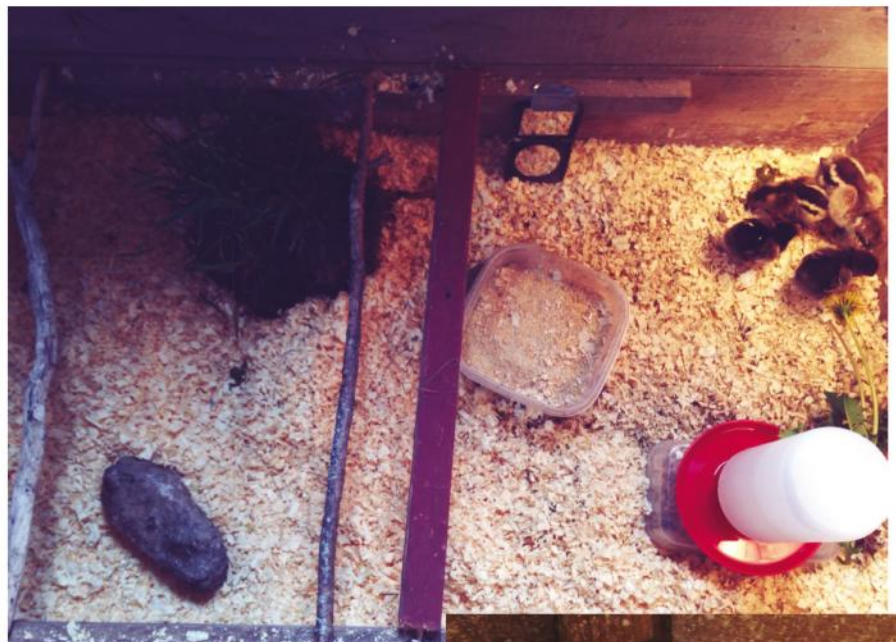
Having an area properly prepared for your new chicks or ducklings is important in making sure they grow up healthy and safe. For some, it is easiest to use an old dog crate or a plastic tote and outfit it for the occasion, but if you are going to be getting new poultry regularly or annually, it is often best to build a brooder specifically for raising your young birds.



I still use a brooder box my father built when we brought home a dozen chicks on Mothers' Day almost 20 years ago. A good brooder box should last you, and it should be transferable to different types of fowl.

HOW TO SIZE A BROODER BOX

When considering the size of your box, think of how many chicks you usually get. Most baby birds need little



space at first — in fact, a smaller area will be easier to keep warm for them. While adult chickens require about 4 square feet per bird (how much space chickens need to roam), new chicks will only use a few square inches. As they grow and become more active, they'll start to use more space.

A brooder is generally intended for the first few weeks of your chick's lives, after which they can move out into a grow-out pen, and then in with your adult chickens.

A 3-foot-by-2-foot space is appropriate for up to about 20 new chicks, and could also raise a half dozen ducklings or three to five goslings.

Airflow is important for young birds as it helps keep dust down, but you



don't want your brooder too open or you'll have problems maintaining temperature and keeping it safe from predators. A large box that can have an area

blocked off when your chicks are very small, then opened up for more space as they grow, is ideal.

In addition to the floor space for your chicks, you should also consider how tall you want your walls. Ideal brooders have sides around 2 feet high. Some birds will grow tall fast (such as geese), others won't get over 2 feet even as adults. It is good to have higher sides, though, so you can set up practice roosts inside your brooder.

Be sure to clean your brooder regularly to avoid diseases, and when possible bring in herbs and branches from outside into the brooder to keep your baby birds amused and teach them how to forage in the way they will as adults.

BUILDING A BROODER BOX

We built our brooder from 2-by-12-inch boards with bracing pieces in the corners. For the top, we used chicken wire stretched between a 2-by-4-inch frame so we could easily see in, and the box would get healthy airflow.

Heat lamps can be placed directly on the chicken wire, which put them at an ideal height for keeping the box warm.

Inside the box, we put two small braces half way up the wall that we can use to stretch small sticks across for practice roosting. Removable roosts are ideal, because taking them out is helpful for cleaning.

With a waterer and feeder inside appropriate to the types of poultry you are raising, this should provide an ideal environment for caring for your birds.

WHEN TO MOVE CHICKS

Once your chicks are about 6 weeks old, they will require more space, and you can move them into a grow-out box or into your chicken coop with careful integration.

For their first few weeks, a box as described above with shavings or straw for comfy bedding should be ideal. Be sure to put a thermometer in a corner of your brooder, so you can ensure it is at the best temperature for the age of your chicks.

If you are only getting a few birds, block off an area of the box while they are still small.

If you are raising a large number of chicks, the same principles can apply to a bigger box, or even to an area of your barn dedicated to brooding.

Raising chicks and other birds is a lot of fun, and having a brooder box ready to go every year takes some of the stress out of preparing for them. Soon you'll be enjoying fresh eggs from your new friends!

Foods You Should Not Feed To Chickens

By Nathan Lott

Story time!

A few years ago, on a warm, sunny, October afternoon, I found myself armed with a dust mask, a pair of gloves, a shovel, and a broom — all geared up and ready to clean out the ol' chicken coop.

It may sound crazy, but before long, I was having the time of my life: hummin' songs, scrapin' dried chicken poop, and scoopin' up dusty straw — but I was jolted out of my peaceful reverie when a little gray mouse came out of nowhere and scampered right over my feet. (Apparently, I'd inadvertently demolished his nest with my cleaning.)

The poor little beggar made it out of the wreckage unscathed, but then he made the mistake of running right past me and into the chicken yard, where our fat old hens were scratching.

Now, I was still kinda new to rais-

ing chickens at the time, and I'd always thought chickens were more or less vegetarians, y'know? Sure, they'd eat a grasshopper now and then, or scratch up the occasional earthworm, but their diet consisted mainly of grains and legumes and other plant-based stuff, didn't it?

Certainly, they wouldn't go for any actual meat.

Well, I was dead wrong — and unfortunately, so was the mouse.

I learned a valuable lesson that day: Chickens will eat just about anything, but that doesn't necessarily mean that they should be eating it.

So, without further ado, here's a list of common foods you should not feed your chickens:

DRY BEANS

According to this article (www.raising-happy-chickens.com/what-chickens-should-not-eat.html), uncooked dry beans are extremely toxic to both humans and chickens alike thanks to a nearly unpronounceable protein called phytohemagglutinin. (Quite the mouthful, right?)

They say a chicken can die from eating as few as three or four beans, with death occurring in as little as an hour.

AVOCADOS

Avocados contain a fungicidal toxin called persin. I've heard some folks say that it's only the skins and the pits that



Keep your flock as healthy as possible with the proper nutrition and shelter.

you have to worry about, but the flesh is fine in moderation. Other people will tell you to steer clear of avocados altogether when it comes to your flock.

In our neck o' the woods, avocados get slicked up so fast we've never had any leftovers to feed to the chickens anyway!

CHOCOLATE

I don't know why a person would go wasting chocolate on their feathery moochers — especially since a chicken's palate is more geared towards maggots and mealworms — but more importantly, chocolate contains an alkaloid called theobromine, which is toxic to chickens (and dogs and cats too, in case you were wondering). Even a very small amount can be fatal.

GREEN POTATOES

When potatoes are left out in the light for an extended period of time they start ramping up their internal preservation processes, turning them green and resulting in high accumulations of solanine, which can cause all sorts of health problems for your chickens.

ONIONS

Onions (and garlic, chives, leeks, shallots, and all the other members of the *Allium* family) contain various forms of thiosulfinates, which can oxidize the hemoglobin in a chicken's blood, leading to severe anemia.

MOLD

There are a lot of molds out there. Some good (like penicillin), some bad. Feeding moldy feed to your chickens can lead to everything from respiratory problems to liver cancer.

APPLE SEEDS

Apple seeds (and pits from peaches, apricots, cherries, plums, etc.) all contain a substance called amygdalin, which, when fully digested, produces a small amount of cyanide.

CITRUS

Citrus is one of the more controversial foods in this list.

Some people will tell you that the

high acidity in citrus fruits leads to thinner eggshells. Other folks claim it will reduce egg production. There are even anecdotal tales of citrus causing feather plucking and diarrhea!

CLOSING DISCLAIMER:

I am not a scientific authority on this subject! Nor am I a biochemist (that would be my wife).

Although I have done hours and hours of research for this article, I'm still not an expert on chicken physiology, nor do I understand all of the mechanisms at work in toxicology. At the end of the day, this list is a very small sampling of potentially harmful foods.

For a more comprehensive list, please consult your veterinarian.

When Chickens Become Hedgehogs

By Leigh Schilling Edwards

I currently own a lovely flock of nearly 60 hedgehogs. I'm fairly certain they

used to be chickens, but in the last few weeks a bizarre metamorphosis has occurred, leaving my birds spiny and odd-looking. In fact, every year about this time, my yard starts to look like there was a major pillow fight. Closer inspection would suggest the pillows lost!

My once shiny, fluffy poultry begin to resemble walking rags. An overabundance of eggs dwindles to just a few each day. Strange objects start to appear in the nest boxes — eggs with ridges, fragile shells, or even no shells at all. It's like a chicken-zombie apocalypse!

In early to mid-fall of each year, chickens over the age of about 9 months will go through a molt at which time the old, ragged feathers they have worn for the last 12 months are shed and are replaced by healthy new feathers. This is nature's way of providing birds with good protection against the elements before the colder weather sets in (usually) so those of us who keep poultry don't find a coop full of hensicles after the first hard freeze.



A brood of hedgehogs.



Clockwise from left: Molting produces chickens that look like walking rags; the pillows lost the fight; pin feathers start appearing and you may need to use pliers to help the process.

If you are a hunter, remember your chickens will enjoy all the parts of the deer/elk/turkey/etc. that you don't want. (Your little chicken zombies would love some brains ... and hearts, and livers, and unidentifiable innards!)

REDUCTION IN PRODUCTION:

During this time your hens will lay fewer eggs — or none at all. Before you send them to the stew pot, understand that most hens start laying again once they have recovered from their molt.

Sure some hens are lifetime freeloaders who don't care to work in exchange for room and board, but depending on age (younger than 4 years) and breed (heritage breeds tend to lay for many years as opposed to production breeds, which lay well for only 18 to 24 months), freeloader hens tend to be the exception and not the rule. (Remember that while the left wing and right wing may suggest different things about such a hen, both wings belong to the same bird and taste the same once in the pot.)

If your hens are still laying, the eggs may be odd. You may get eggs with ridged shells or no shells at all. You could get teeny-tiny eggs (also known as "wind eggs" or "fart eggs"), and hens may even start eating their own eggs or their friends' eggs as they search for ways to

consume more protein. Collect eggs regularly or put ceramic eggs in the nests to discourage egg eating during this time.

CHICK CHECK:

Molting season is a great time to give your birds a once-over. With fewer feathers and less overall fluff, it is easier to find mites or lice that may have taken up residence on your birds.

It is also easier to tell if your birds are of a good weight or need either a diet or deworming.

The best time to catch and handle your birds is after they go to roost. Wait until dusk and take a flashlight and a helper. Check the birds one by one and then put them back on the roost. Wood ash is great for treating external parasites, and ground up pumpkin seeds can be fed to your flock as a natural dewormer.

FEATHER GROWTH:

Pin Feathers



If you have chickens with bare spots, you will first notice a pimple-like bump developing, signaling the growth of a new feather. As the sheath of the feather lengthens, it will appear to be a different color than the rest of the fully grown feathers due to the blood supply



Of course every year there seems to be at least one poor hen that didn't get the annual molting memo and suddenly goes 90-percent bald two days before the temperatures drop down to minus 3 Fahrenheit (like the one pictured above who is now residing in a cage in a warm bathroom).

So let's talk about the care and feeding of your hedgehog chickens.

PROTEIN:

Growing new feathers takes lots of energy. The best way to help your flock is to make sure they have plenty of protein. Consider switching their feed to one that contains at least 20-percent protein until they have finished their molt. You can also supplement their diets with cat food, pelleted fish food, or other products rich in meat proteins.

in the shaft during development.

If a pin feather becomes damaged or broken, it can bleed quite a bit. The best thing to do if this happens is to use needle-nose pliers to gently pull out the pin feather at the base, which will stop the bleeding much sooner than at the skin level. A new pin feather will develop and grow in the following weeks.

Feather Sheath

As the blood supply recedes from the growing feather, a tuft will appear at the top of the sheath.

The feather sheath acts as a protective covering for the developing feather.

As the feather barbules develop, the sheath flakes off, exposing the newly grown feather. During this time, your birds may appear to have horrific dandruff. No need to grab the dandruff shampoo — the flakey residue from the sheath will fall off as your chicken preens or takes a dust bath.

AND FINALLY:

A few weeks after the molt begins, your birds will look better than ever. The filthy, dull, frayed feathers will be replaced with healthy, shiny, new feathers. Some birds may even appear larger than they did before molting because

Top to bottom: The dandruff-like flakes left by the sheaths will disappear once your chicken preens or takes a dust bath; a Swedish Flower cock before and during a molt; a Swedish Flower hen before and after a molt — note how much larger she looks; the feather sheath protects the new feather.



any broken or shredded feathers will be replaced with thick, full ones, and down will be more abundant going into the cold months.

Most birds do finish their molt before the temperatures get harsh, and, even those that don't, tend to do just fine as temperatures drop.

If you have a bird go through an extreme molt during extreme temperature drops, then use your judgment. More than a few chicken keepers have snuck a hedgehog into a guest bathroom without their family's knowledge.

Happy molting! 🐔

TAKING PRECAUTIONS

Recent outbreaks of salmonella highlight the need for care when tending a backyard flock.

Courtesy Pennsylvania State University News Service/Jeff Muhollem

Last year, the U.S. Centers for Disease Control and Prevention reported 10 outbreaks of salmonella in 48 states linked to backyard poultry. Close to 250 people were hospitalized — 36 percent of those infected were children under the age of 5. One death was reported with these outbreaks.

“More and more people are raising backyard chickens, and they need to understand proper techniques for handling birds and equipment,” says Phillip Clauer, extension specialist, College of Agricultural Sciences, Penn State.

Clauer noted that because young poultry are cute, soft, and enjoyable to handle, people often forget the birds could be infected with salmonella bacteria. Young children, older adults, and people with weakened immune systems, he says, are especially at risk.

Eva Wallner-Pendleton, poultry veterinarian at the Animal Diagnostic Lab at Penn State, added that toddlers are particularly vulnerable because they explore the world with their mouths.

“People often have the mistaken idea that backyard birds and their eggs are free from salmonella, but a recent study at Penn State showed a small percentage of positive eggs exist even in this sector,” says Wallner-Pendleton. “In fact, any poultry can be carriers of salmonella, and they usually have no outward symptoms of disease.”

Eggs, too, can make people sick, she says. “Certain salmonella, such as *Salmonella enteritidis*, can be shed into

eggs, and unless eggs are thoroughly cooked, they can potentially make people sick.”

In humans, infection with salmonella may cause diarrhea, fever, and abdominal cramps. Most patients recover without medical treatment; however, a few may require hospitalization.

Safe handling practices are the key to avoiding salmonella infection. Clauer and Wallner-Pendleton offer several tips:

- Wash hands thoroughly anytime poultry or anything in contact with the birds’ environment are handled.
- Parents should ensure children wash hands promptly after handling poultry.
- Do not hold birds near the face or kiss them.
- Keep poultry out of homes and living areas. They cannot be bathroom trained.
- Do not eat and drink when working with birds or in their pens.
- If poultry have access to gardens, properly wash any produce before eating.
- Cook all eggs completely.
- Buy birds from hatcheries that participate in the U.S. Department of Agriculture National Poultry Improvement Plan (USDA-NPIP); however, be aware that not all hatcheries test breeding flocks or hatching eggs for salmonella. Only those participating in a salmonella



monitored program do so. The NPIP website (www.poultryimprovement.org) contains a directory for each state and lists the program in which the various hatcheries participate.

- Clean drop pans daily and pens with pine shavings at least monthly.
- Rodents often harbor salmonella, which can then infect the birds if rodents contaminate their food. Controlling rodents is very important for reducing salmonella in the birds’ environment.
- Keep in mind that shoes worn in pens can become contaminated. Having dedicated shoes or over-boots when entering the pens that can be removed when leaving can help reduce tracking salmonella as well as other diseases that are spread in the droppings. 🐔

For more information on keeping backyard poultry flocks, including safe handling practices, visit the Penn State website at extension.psu.edu/animals-and-livestock/poultry. For more on the 2017 salmonella outbreaks, go to the Centers for Disease Control and Prevention website at www.cdc.gov/salmonella/live-poultry-06-17/index.html.



Feed the Flock

Whether free-range, forage or a combination of the two, learn more about what makes an effective diet for your chickens.

By Karrie Steely

The old adage “You are what you eat” certainly applies to chickens. A strong foraging instinct gives chickens the ability to naturally thrive on a wide variety of plants and insects. However, some modern backyard birds aren’t lucky enough to range countless acres and forage for their nutritional needs.

Further, young chickens have different needs than mature birds. In addition, layers and meat birds should be

fed specific diets depending on their purpose. As the seasons change, so do nutritional requirements. So what is a chicken keeper to do? That all depends on what kinds of chickens you have and what their purposes are.

Back in the old days, Grandma would toss a few handfuls of scratch grains and some kitchen scraps to the yard birds each day. Her hens would free range around the farm during the day and roost in the coop at night. So what’s so

complicated about feeding chickens, then? First of all, we know a lot more about nutrition now than we did back then. Secondly, if chickens have access to a large range, they will naturally eat what their bodies require, including plants, grubs and insects.

Other factors and management styles complicate the matter even more. Grandma probably didn’t use artificial light to keep her hens laying through the winter when there

were no bugs or weeds to consume, so the birds were not producing when nutritional inputs were lowest. Feeding scratch alone doesn't meet all nutritional requirements.

So with all of this in mind, what should you feed your flock? Do you keep chickens for eggs, for meat, or for a combination of both? How much free-range access do they have? Can you produce some of the feed yourself? After you've determined this, the next step is to get to work finding the right feed for your situation.

Reading the Feed Bag

Commercial feed bag labels list the basic data of the nutritional content in the bag. They won't always list individual ingredients specifically, but the nutritional value is guaranteed for a certain amount of time, so be sure to check manufacturing dates on the label. A manufacture date and identity of the production plant is required.

If you're not sure of the shelf life of the feed you are looking at, ask the store clerk.

After a few months, nutritional value decreases. In addition, feed can become stale, rancid or moldy, especially in humid climates. Moldy or rancid feed can cause digestive and respiratory problems. Always store feed in tight bins away from heat, moisture and direct sunlight in a well-ventilated area that is free of insects and rodents.

If you want vegetable-based feed without animal by-products, that should be stated somewhere on the bag or label, as well.

Types of Feed

At the feed store, you'll find a variety of types of chicken feed. Layer feed is formulated for actively laying hens. Feed for meat birds is often referred to as broiler starter or broiler finisher. Feeds for actively growing chicks will be referred to as chick starter or chick grower. Check the label to find if the feed is medicated, and make determinations based on your preference and management style.

Chicken feed also comes in a variety of forms, such as pellet, crumble or



Check the feed you purchase for chicks; it'll be different from the nutrition needed by your laying hens. Look for "chick starter" or "chick grower" on the bag. Opposite: Feeding time is the perfect opportunity to inspect your flock and even work on taming your birds.

mash. In pellet form, it is just that – an extruded pellet. Crumbles, essentially, are simply pellets that are broken apart into smaller bits, which make it easier to eat. Mash is between a crumble and powder form, and best fed mixed with a little water. Chicken "scratch" is cracked corn with other whole grains such as oats or milo.

Grit

Grit simply refers to grains of rock that aid digestion in the gizzard, where it helps to grind up the food. If your chickens eat anything other than complete feed, which breaks down easily, grit should be offered if they don't have access to bare soil where they can pick it up on their own.

Feed the Young

From the start, chicks should be given free access to feed and fresh water. As you grow your chicks, particular feeds will vary depending on the birds' purpose – layer or broiler – but a good

guideline could be as follows. Starter feed will typically contain 20- percent protein and should be fed for the first six weeks or so.

Grower ration will contain less protein than starter, but more than layer ration, typically around 16 percent in most commercial grower feeds. Feed this to your birds from about 6 weeks to 18 weeks of age. An alternative is feeding a combination starter/grower ration. At 18 weeks, an adult diet should be fed.

Commercial feeds can be medicated or nonmedicated. Medicated feeds are designed to help chicks remain healthy in crowded, confined, or otherwise stressful conditions.

If you're able to find organic or non-medicated feed, it is entirely possible to brood your chicks to adulthood without fear of coccidiosis, assuming your management practices include clean, uncrowded and otherwise favorable conditions. This could lead to more disease resistance and better health in



A mother hen and her chicks explore outside the coop in order to scratch and feast on insects and vegetation.

the long run, and less residue in eggs, meat and the environment.

Never feed layer ration to growing chicks. The extra mineral content in layer ration could interfere with proper development, especially with regard to reproductive organs that will be extremely vital to egg production later on. Start feeding layer ration at around 19 weeks, right before they start their laying life.

Laying Hens

Female chickens usually begin laying between 18 and 22 weeks of age. Be sure to gradually transition from the grower feed to the layer feed over seven to 10 days. Laying hens need 15 to 18 percent protein in their diets for optimal egg production. What they eat will influence egg quality, specifically shell hardness and the nutritional value of the eggs. Complete feeds formulated for layers cover these dietary requirements. Most commercial layer feeds have vitamin D added (and more phosphorus and calcium than chick feeds), which ends up in the eggs.

Some feeds include ground flaxseed or algae meal, which increases omega-3

fatty acids in the eggs. These things will be listed on the bag or label.

Meat Birds

Birds raised for meat should put on as much weight as possible in a short amount of time, while also taking into consideration mobility, heart health and other health concerns. As the birds get older and larger, they become less efficient and eat a larger amount of feed for each pound of weight gained. Older birds produce more fat and should be slaughtered as close to the desired weight as possible. Commercial feeds formulated for raising meat birds are complete feeds, containing the essential vitamins, minerals and energy the birds need for growth. Most are formulated for broiler chickens, turkeys, ducks, geese and pheasants.

Be sure to have ample feeding space so that all birds can eat at the same time. If you experience leg problems in your birds, cut back the feed some, or switch to a lower protein feed to slow down the birds' growth rate.

Individual feeds, protein constitutes, and so forth are highly variable and depend on your management practices.

Here is one recommendation. Start chicks from hatch to 3 weeks of age on a 22- to 24-percent protein starter. After three or four weeks, switch to a 16, 18 or 20 percent grower ration. Meat bird breeds are best slaughtered between 4 and 14 weeks of age, depending on sex, breed, and desired weight, size and amount of fat.

Eight weeks is typical for the widely popular Cornish Cross, but it will be longer if you choose a slower-growing dual-purpose heritage breed like the Buckeye, or choose to restrict the growth rate of any breed by not pushing the protein content to the max.

Some of these feeds are medicated, so check the label. As mentioned earlier, there are pros and cons to medicated feed. Keeping many birds in a small space increases stress and the likelihood of disease, so medicated feed is important. For a small backyard flock, it can be unnecessary and perhaps even undesirable. Further, certain medications in feeds require a withdrawal time before slaughter, and those will be marked on the label – read it closely and carefully.

Nutritional Needs Change

Unless you put an artificial light on your hens, egg production will usually slow down or completely stop during the winter months in northern climates. Chickens need extra carbohydrates and calories to keep warm in cold weather. In addition to regular feed, add scratch or other high-carbohydrate grains, especially before bedtime. The corn in scratch is mainly carbohydrate, and is a great supplement for warmth and weight.

Digesting the extra calories produces body heat. Remember that scratch should not replace regular feed, but rather supplement it. When it's cold, chickens will eat more, so make sure they have free access to food, and fill their water at least twice a day if it freezes in a few hours.

What Else Can My Chicken Eat?

If you offer your birds a complete feed, all of their nutritional requirements will be met. Kitchen scraps are fine in limited amounts. Chickens are omnivorous and enjoy most of what

you had on your dinner table – with the exception of chicken. Some people add supplements to increase egg nutrition, enhance show bird plumage, combat stress and disease, and so on. It's ideal to allow them to free range on plants and bugs when possible, and it keeps them happy.

Most chicken experts warn against feeding eggshells to hens. Although they are a good source of calcium, feeding eggshells can result in birds cannibalizing new eggs that have been laid in the nest box. Once the habit gets started in a flock, it is hard to break. The best solution is to buy a calcium supplement like crushed oyster shell or offer a bathing area filled with crushed limestone to allow the birds free choice consumption. 🐔



Rather than using a brooder, let nature take over and allow a broody hen do all the work. The hen and the chicks will all benefit from this method.



Making Your Own Feed

Most chicken keepers choose to use complete feeds for the convenience, because all the guesswork is taken out. Some folks, however, want to be able to grow and/or make their own feed. If you choose to make your own, it's essential that it contains all the basic nutritional requirements for your birds. Feeding an incomplete diet will compromise your birds' health and growth, as well as the nutrition in the eggs.

Finding the right combination of ingredients to create a balanced, complete feed with the necessary macronutrients (proteins, carbohydrates and fats) and micronutrients (vitamins and minerals) is key. Ideally, the feed should be ground and

mixed, because chickens will pick out their favorite components first.

Some examples of common ingredients:

Proteins: Soybeans, canola meal, cotton meal, rice meal, fish meal, alfalfa, peas, seeds, meat products

Carbohydrates: Corn, sorghum, wheat, milo, oats, barley, other grains

Vitamins: Kelp, cultured yeast, commercial vitamin mixes

Minerals: Salt, limestone, calcium carbonate, calcium phosphate, oyster shell, commercial trace mineral mixes

Fats: Vegetable oil, flaxseed, sunflower seed, fish oil, blended fat products from livestock rendering such as lard or tallow, some types of kelp or algae

Eggs, Eggs, and MORE EGGS!

Once your flock has started laying eggs, what do you do with all the extras?

Compiled by GRIT Staff

Your flock has begun producing eggs. Your family loves the dishes you've added to the menu, and selling the eggs has turned a tidy profit. But you still have lots of eggs to work with. What do you do?

Look for new recipes, of course!

We've pulled the following recipes from the GRIT recipe archives in the hopes your family will enjoy them as well as the tried-and-true recipes in your recipe box.

Scotch Eggs

8 hard-cooked eggs
2 pounds fresh bulk sausage
1 cup grated onion
1 cup soft bread crumbs
2 eggs, well-beaten
1½ cups corn flakes, finely crushed

SAUCE

¼ cup butter or margarine
1 cup chopped celery, including leaves
¼ cup flour
2 cups milk
1 can chicken broth

1 can cream of celery soup
Salt and pepper to taste
8 slices bread

1 Hard boil eggs; remove shells and refrigerate overnight.

2 Preheat oven to 350 F.

3 Mix sausage, grated onion, bread crumbs, and half of beaten eggs. Divide sausage mixture into 8 portions and encase each egg. Sausage coating will be about ¼-inch thick.

4 Coat covered eggs with remainder of egg mixture and roll in crushed corn flakes. Chill for 30 minutes, then place eggs on rack in roasting pan. Bake for 30 to 40 minutes, or until crust is golden brown.

5 To prepare sauce, melt butter over low heat; saute celery leaves for 5 minutes or until tender. Stir in flour and add milk. Cook over low heat, stirring constantly, until mixture thickens. Stir in broth and soup. Continue cooking over low heat until mixture is thick and bubbly.

6 To serve, toast bread. Cut small hole in center of toast, and place egg on toast. Ladle sauce over egg and broil before serving.

Egg Drop Soup

Yields 4 servings.

4 cups chicken broth
1 tablespoon cornstarch
2 tablespoons cold water
2 scallions
1 egg
1 teaspoon vegetable oil
Salt and pepper to taste

1 Bring broth to a boil. While broth is heating, dissolve cornstarch in cold water. Slice white and edible green parts of scallions. Beat egg with oil.

2 When broth reaches boiling point, stir cornstarch mixture well and add slowly to broth; mix well. Season broth mixture with salt and pepper. Add the scallions.

3 Turn off heat and immediately add beaten egg mixture in a steady stream, stirring broth constantly so egg breaks up into floating bits.

Classic Angel Food Cake

Yields 12 servings.

2 cups granulated sugar
1½ cups cake flour
13 egg whites
¼ teaspoon salt
1½ teaspoon cream of tartar



½ teaspoon almond extract
1 teaspoon vanilla extract

1 Preheat oven to 325 F. Sift flour and sugar separately 7 times each; set aside.

2 In large bowl, beat egg whites until foamy; sprinkle salt and cream of tartar over egg whites, and continue beating until stiff but still moist.

3 Beat sugar, about 2 tablespoons at a time, into egg whites; fold in flour, about ¼ cup at a time. Fold in almond and vanilla extracts.

4 Spoon batter into ungreased 10-inch tube pan, cut through batter gently with a knife to break air bubbles.

5 Bake for 45 to 50 minutes, or until cake springs to the touch. Invert cake, cool completely before removing from pan.

Cook's Tip: Eggs that have been well chilled separate easily. When egg whites are allowed to reach room temperature, they will be easier to beat.

Old-Fashioned Egg Custard Pie

Yields 8 servings.

1 9-inch pie shell, unbaked

3 eggs

2 cups milk, scalded

½ cup granulated sugar

⅛ teaspoon salt

1 teaspoon vanilla

2 to 3 teaspoons butter, melted

Ground nutmeg

1 Preheat oven to 450 F. Prepare pie shell and set aside.

2 Beat eggs until light and foamy. Add scalded milk, sugar, salt, and vanilla. Brush inside of pie shell with melted butter. Then pour warm custard into pie shell and sprinkle with ground nutmeg.



3 Bake for 10 minutes; reduce heat to 325 F and continue baking additional 25 to 30 minutes, or until custard tests done. To test, insert knife in center of custard; when knife comes out clean, custard is done. Cool.

Classic Flan

½ cup sugar

6 eggs

½ teaspoon vanilla

1 can (14 ounces) sweetened condensed milk

1 can (12 ounces) evaporated milk

Strawberries, optional

Mint leaves, optional

1 In small saucepan, over medium heat, cook sugar, stirring constantly, until melted and deep golden brown. Remove from heat and immediately pour into 9-inch flan dish or pie plate, quickly tilting dish to completely coat the bottom.

2 Place dish in large baking dish or broiler pan.

3 Heat oven to 350 F.

4 In medium mixing bowl, beat together eggs and vanilla; set aside.

5 In medium saucepan, stir together milks. Cook over medium-low heat, stirring constantly, just until mixture boils; remove from heat.

6 Slowly pour hot milk mixture into egg mixture, stirring constantly until well-blended.

7 Place pan containing sugared dish on middle rack in oven. Slowly pour egg mixture into dish. Pour very hot water into outside baking pan to within ½ inch of the top of sugared dish.

8 Bake for 35 to 40 minutes, or until knife inserted near center comes out clean. Remove promptly from pan holding hot water.



9 To serve flan warm, cool on wire rack for 5 to 10 minutes. Gently loosen sides with spatula. Invert onto serving platter.

10 To serve cold, refrigerate for several hours, or overnight, to thoroughly chill then unmold.

11 Garnish with strawberries and mint leaves, if desired. Cut into wedges.

Lemon Pound Cake

Yields 16 servings.

CAKE:

½ cup butter

1 cup margarine

2½ cups granulated sugar

5 eggs

1 cup buttermilk

¾ cups sifted cake flour

¼ teaspoon salt

½ teaspoon baking soda

2 teaspoons lemon extract, or

1 teaspoon lemon extract and

1 teaspoon vanilla

LEMON GLAZE:

1 cup confectioner's sugar

1 to 2 tablespoons lemon juice, fresh or bottled

CREAM CHEESE FROSTING:

1 package (3 ounces) cream cheese, softened

1 tablespoon milk

½ teaspoon vanilla extract

2 to 2½ cups confectioner's sugar

FOR CAKE:

1 Preheat oven to 325 F. Grease and flour tub pan; set aside.

2 Allow butter, margarine, eggs, and buttermilk to reach room temperature. Cream together butter and margarine. Add sugar and beat until light and fluffy. Add eggs, one at a time.





3 Sift flour with salt and baking soda. With electric mixer at low speed, add flour mixture to butter mixture alternately with buttermilk, ending with the flour mixture. Add flavoring.

4 Bake in prepared pan for 1½ hours, or until cake top springs back to the touch.

5 Cool cake in pan about 10 minutes. Remove. Glaze while still warm. If cream cheese frosting is desired, allow cake to cool well before adding frosting.

FOR GLAZE:

6 Mix sugar with lemon juice. Allow cake to cool about 10 minutes before removing from pan. Spoon glaze over warm cake.

FOR CREAM CHEESE FROSTING:

7 Blend cream cheese with milk, vanilla extract, and confectioner's sugar to spreading consistency. Spread over cooled cake.

NOTE: To reduce the fat in this cake recipe, substitute reduced-fat or no-cholesterol margarine for the butter and margarine.

Use an egg substitute and reduce sugar by ¼ to ½ cup, or to taste.

Select lemon glaze instead of frosting or skip both and serve this cake with fresh fruit as a delicious dessert.

Pad Thai

Yields 4 servings.

- 1 cup fresh bean sprouts (3 ounces)
- 1 jar or can (7 to 8¾ ounces) whole baby corn, drained
- ½ cup sliced green onions
- ¼ cup chopped peanuts
- ½ cup fresh straw mushrooms (2 ounces)
- 4 eggs



- ¾ teaspoon garlic powder
- 4 ounces uncooked rice noodles or vermicelli pasta, cooked and drained
- ½ cup bottled Pad Thai sauce

1 In medium bowl, toss together bean sprouts, baby corn, green onions, and peanuts until combined.

2 Coat large nonstick saucepan with cooking spray; heat over medium heat until hot. Add mushrooms and saute until tender, 3 to 4 minutes.

3 In small bowl, beat eggs and garlic powder until blended; pour over mushrooms.

4 Cook, stirring to break up eggs, until eggs are still moist but no visible liquid egg remains.

5 Add noodles, sauce, and bean sprout mixture. Cook, tossing gently with 2 spoons, until heated through. Garnish with shredded carrots, cilantro, and lime wedges.

Quiche Lorraine

Yields 6 servings.

- 1 cup shredded Swiss Gruyère cheese (4 ounces)
- 8 slices bacon, cooked crisp and crumbled
- 1 9-inch pie crust, baked
- 6 eggs
- 1¼ cups half-and-half
- ½ teaspoon salt
- ¼ teaspoon white pepper
- ½ teaspoon nutmeg

1 Heat oven to 375 F. Sprinkle cheese and bacon evenly in bottom of pie shell.

2 In medium bowl, beat eggs, half-and-half, salt, pepper, and nutmeg until



blended. Carefully pour over filling in pie shell.

3 Bake in center of oven for 35 to 40 minutes, or until center is almost set. It should jiggle slightly when dish is gently shaken, and a knife inserted near center should come out clean.

4 Let stand for 5 minutes. Cut into wedges.

New York Cheesecake

CRUST:

- 1 cup graham cracker crumbs
- 5 ounces butter
- 1 tablespoon vanilla

CHEESECAKE:

- 4 packages (8 ounces each) cream cheese
- 1½ cups sugar
- 2 tablespoons flour
- 4 eggs
- 1 teaspoon lemon rind
- 1 teaspoon orange rind
- ½ teaspoon vanilla
- 1 egg yolk
- ½ cup heavy cream

1 In bowl, combine crust ingredients. Press into 9-inch springform pan; set aside.

2 Preheat oven to 350 F.

3 In large bowl, blend cream cheese until smooth. Slowly add sugar. Add flour and blend well. Add eggs one at a time, and blend well after each addition. Add lemon rind, orange rind, vanilla, egg yolk, and cream; blend well.

4 Pour into prepared pan; bake for 15 minutes. Reduce heat to 250 F and continue baking for 1 hour. Let cheesecake cool in oven for 30 minutes. Remove and let stand for 1 hour. Refrigerate. 🍴

Raising Meat Chickens

Without feeding the local wildlife.

By Candi Johns,
FarmFreshForLife.com

Two categories of chickens grace our farm: layers and broilers. The layers lay eggs. The broilers are raised for meat. The layers are known for making lots of wonderful eggs. The broilers specialize in getting really large really fast.

A layer hen can take more than seven months to reach maturity and usually begins to lay small eggs around 6 months of age. A broiler goes from a tiny chick to the size of a basketball in less than two months. Now that's fast!

If you would like to begin producing some of your own meat, broiler chickens are a great place to start.

Raising chickens is relatively easy. They don't require fancy equipment, pastures or knowledge. And it's over in six to eight weeks. Bonus!

Broiler chickens need food, water, and a safe place to live. The hardest part about raising meat chickens is keeping them alive. I live on a 24-acre farm with a lot of woods. Unfortunately, those wooded areas are home to many chicken-enjoying critters. We have raised meat chickens a few times, and it's always a gamble to see who will get to enjoy the beautiful hens: the local wildlife or us.

Here are a few tips to getting started



Additional fencing helps keep Candi's flock from wandering too far as well as protecting the chickens from potential predators.

(and finished) raising meat chickens on your homestead.

No. 1: Safe and Sound

Yes, I want my broiler chickens to eat grass, bugs, and enjoy sunshine. I also want them to be alive in six weeks so that I can eat them. This is where the challenge lies.

A predator proof fence is the best way to keep your broiler chickens safe. We

have used a rabbit hutch, a dog kennel and a homemade chicken yard with woven wire fencing. All of these options are good ones.

Being flexible and using what you have is a huge part of homesteading.

If you happen to have an empty dog kennel, it can be easily converted into a chicken yard with some chicken wire. If you have a large rabbit habitat without any rabbits in it — that will work! If



The friend who originally provided chickens for Candi's flock still had hundreds remaining so she was able to replenish her flock.

you don't have anything but a roll of leftover, woven-wire fencing and some wooden tomato stakes. Perfect!

This year we started with 22 meat chickens. Key word, 'started.'

DH (Dear Husband) set up a nice yard for them where they could enjoy the sunshine during the day and be closed in the barn at night. He used a piece of fencing and some stakes. The entire set up took 15 minutes and didn't cost anything.

Our chicks came to the homestead during a hot steamy summer month so they did not need a brooder for warmth. If the weather is cool, be sure to provide a brooder fully equipped with a heat lamp for small chicks. Once they get their wing feathers, they'll no longer need the lamp.

No. 2: Don't Step on the Chicks

I had my sweet little meat chicks for one day before I stepped on one. Accidentally, of course.

I was spreading fresh hay for their scratching and pecking pleasure when one scurried underneath the hay. I

didn't know he was under there. As I carefully tip-toed my way out of the pen I felt a lump under my foot. Sure enough, under my foot, beneath the fresh hay I found a chick.

At first I was relieved to see it was still alive. Then I noticed that it was not well. Its neck was broken. It was awful. I didn't know what to do, so I walked in circles and panicked. Walking in circles is what I do when I don't know what to do.

My oldest son was with me. I asked him if he thought my broken-necked chick might be able to recover. After seeing it hopping around with its head laying limply to one side my son said, "No." So, he put it out of its misery

To say that I freaked out is the understatement of the universe. Arg! What?! Sadness! Horror!

"YOU JUST KILLED MY CUTE, BABY, INJURED CHICKEN!"

"Mom, it wasn't going to live. Its neck was broken. Its head was on the ground."

"Give me a minute to start breathing again and I'll be OK."

No. 3: Close the Door

Whatever you are using to protect your broiler chicks, be sure it is closed, locked and secure before bed. Night is when all the critters from the woods come out in search of food.

DH had been working behind the barn, and he accidentally left the back barn door open.

From the house, the garden and the rest of the farm, no one could see that the back barn door was wide open. My baby meat chicks were in the barn. Baby chicks (that are not under a broody mama hen) will peep almost constantly. I think all the cheeping was beckoning any predator in the woods that the buffet was open.

Apparently, an opossum heard the call. And answered. He helped himself to 12 of my broiler chicks. Ugh.

We went from 21 chickens to nine chickens overnight.

I suppose you could get technical and say I had more than nine chickens if you count the dead ones the opossum killed, shredded, and threw all over the barn for me to find. Every time I went



A nasty opossum wrecked havoc on Candi's flock; always document the damage, then check with animal control and the Department of Fish and Wildlife before exterminating any predators.

out to the barn to get something: buckets, pliers, hay, etc., I would find heads, feet, bodies and random chicken parts.

Keep in mind that this is happening over a five-day period — every day I feel like I'm stumbling upon another massacre. With me, the squeaks, squeals and running don't stop just because it's the fourth head I've stumbled upon this week. I still panic, drop things and run.

I hate opossums. And raccoons. And coyotes. You get the picture.

No. 4: Call Local Authorities Before Extermination

The only good side to this story is

that I got to shoot the numskull who shredded my chickens and threw their parts all over the barn for me to find.

I spoke with our local Animal Control Office as well as the Kentucky Department of Fish and Wildlife. They both confirmed that if the wildlife (opossum in this case) is causing documentable problems it is fine to exterminate the animal.

I'm going to say chicken parts everywhere is a problem and the fact that he ended up in the animal trap next to my dead meat chickens is definitely documentable. See the proof above.

No more Mr. Opossum.

No. 5: Don't Stay Out Late

With nine meat chickens left, I was still optimistic about the chicken dinners I would be eating.

It was a Saturday night when we went to a friend's house for dinner, and we stayed out past dark.

Staying out past dark is considered a no-no when chickens are concerned. Generally, you want to get your chickens secured for the evening before it gets dark outside. I was hopeful that since they were in the barn they would be fine until I could get home and lock them in the coop.

Wrong.

You know what happens to chickens who aren't locked in the coop by dark don't you? Varmint food. I'm not sure what got it, but the next day I had eight chickens. Isn't this fun?

This story has a happy ending.

My friend with the CSA, who gave me the original 22 chicks, still had a couple hundred to spare. He was happy to give me eight more, after all he ended up with more than 300 chicks for 5 cents each.

This put me back up to 16 meat chickens. I am pleased to report that all 16 meat chicks grew up to be fat, healthy chickens and have been relocated to the freezer.

If you have tried meat chickens and felt like all you did was feed the varmints, be encouraged. If you've never raised meat chickens and would like to try, don't be discouraged.

Meat chickens can be raised successfully without feeding the local wildlife by following a few tips:

1. *Provide safe and secure living quarters for the flock*
2. *Don't step on them*
3. *Close the door*
4. *Call the authorities for proper methods for nuisance removal*
5. *Don't stay out too late*

The great news is that although we lost a few, we put 16 in the freezer. We also eliminated one chicken-eating nuisance from the homestead, which is always something to celebrate.

I'll call that a success. 🐔



CHOOSING CHOOKS

Select a chicken breed well-suited to your climate and avoid losing animals to extreme temperatures.

By Doug Ottinger



Wyandottes are calm, cold-hardy, and adaptable to a wide range of management practices. The Wyandotte's eggs are large and plentiful, and quality meat make it a great dual purpose breed. TOP RIGHT: Buff Orpingtons are docile, excellent layers, and are a great choice for small-scale production.



Whether you're getting baby chicks for the first time, or you are an experienced poultry keeper, when it comes time to add birds to your flock, thinking about your year-round climate increases your chances of success. While there are no hard-and-fast rules concerning which chickens will survive and thrive in a given area, there are breeds that are more suited for cold-tolerance, and other breeds that are better suited to those regions with extreme heat.

During certain times of the year, even areas with moderate climates may have weather that is less than conducive to the health and well-being of your flock. Giving thought to some of these issues will certainly not hurt when you are making the decision of which breeds you want to raise.

Numerous books and websites offer advice on both cold and heat tolerances for different breeds of chickens. Researching a breed's tolerance to both, before acquiring, is always a good thing to do.

The only problem is the fact that terms like *heat* and *cold* can be very subjective. Ninety degrees Fahrenheit, anywhere, is hot; 120 degrees, such as can be experienced in many desert areas, gives a whole new meaning to the word *hot*. A breed that survives in 90-degree weather may not fare so well if the temperature rises another 20 or 30 degrees. The same is true for cold areas. Fifteen or 20 degrees Fahrenheit is



Small fans, access to dust baths, adequate ventilation, and even a dish with a couple of inches of cool water to stand in can offer relief from heat. In extreme cold temperatures, some folks add an infrared heat bulb to the coop, but make sure it is secure.

definitely cold; 20 degrees, or more, *below* zero, begins to make the 15 or 20 above look and feel rather balmy.

Certain areas, such as the Central Valley of California, are generally considered very temperate climates. However, as anyone who has spent much time in the region can tell you, summer heat waves can be almost unbearable. While the summer heat may be good for developing sugar in fruit and wine grapes, it can be devastating to poultry flocks. During the years I lived in California, I lost Cochins, Rhode Island Reds, and even Mediterranean breeds (normally thought of as heat-tolerant) during Central Valley heat waves, and I've seen commercial flocks of White Leghorns have sizable mortality losses during the same periods.

Today I live in northwest Minnesota, a world away from California's Central Valley. I still keep chickens, but now have an entirely new set of concerns each winter. Large combs and wattles can become frostbitten on the tips, or even freeze solid. While many birds can survive this horrible experience, it is painful and not something any poultry keeper wishes on his or her flock.

Even more devastating are feet and shanks becoming frozen. This is not only painful for the birds, it is generally fatal. Once thawed, the frozen legs and feet actually decay and fall off, rendering the bird disabled. Even if the bird survives the infections that commonly set in, it often has to be euthanized, or simply gives up the will to live, and dies soon thereafter.

Many publications and websites advise poultry owners to apply Vaseline or petroleum jelly to the combs, wattles, and even shanks to avoid freezing. This works to a point, but 20-below has a way of permeating through petroleum jelly, in very short order. One of the safer bets is to choose breeds that can live in and survive climatic extremes, if you live in an area that experiences them.

Hot-Weather Breeds

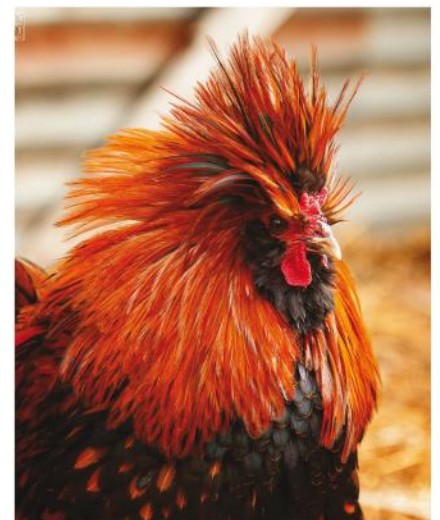
Lighter-weight breeds of chickens usually do better in the heat, compared to heavier-weight breeds. Birds do not have sweat glands, so they must use other methods to expel heat from their bodies. The first way is respiration. On hot days, you will notice chickens standing around with their beaks open, panting. They will often hold their wings away from the body, in a drooping position.

If you give them a shallow dishpan or tub, with 6 to 8 inches of cool water in it, you will often see them standing in it, soaking their feet and cooling down that way. It is actually a rather humorous sight. You may also notice them taking a dust bath. All of these are normal actions in extreme heat.

They will also seek out shade. However, it is still good to keep an eye on them, several times a day if possible. Birds that are down and do not get up when approached may

be suffering heat distress. Birds that are prostrate on the ground, unresponsive, panting, with eyes closed, even with water, shade, and air circulation all present, are obviously in extreme distress. Cold-water baths will sometimes revive them, and the bird may survive. However, egg production in hens, as well as fertility in breeding cocks, generally drops significantly, sometimes permanently, after such an experience.

If you live in areas that have extremely hot summers, you may want to think about concentrating on lighter-weight breeds, such as the Mediterranean classes of fowl. These include such breeds as Leghorns, Andalusians, Sicilian Buttercups, Minorcas, and Anconas. White Leghorns are the chickens generally used as commercial layers. They can also be a nice bird for the home flock. One drawback to any





Mediterranean breed is the fact that they can be rather nervous and flighty. They often startle easily, especially White Leghorns. They generally need to be kept in a pen or run that has chicken wire or some other covering on the top, to prevent them from flying out and going places you don't want them to go. Mediterranean breeds are generally prolific layers and lay white eggs.

These breeds (with some exception) have large, single combs. The comb is made up of heavily vascularized tissue and is another one of the bird's cooling mechanisms. Arteries and veins crisscross each other in such a way that heat transfer continually occurs. A network of shunts opens and closes as the blood is pumped through the comb, giving time for heat transfer and escape to take place.

If you want breeds that are calmer and lay colors of eggs other than white, consider Australorps, Speckled Sussex, or Ameraucanas (Easter-egg chickens). All three do fairly well in both hot and cold weather. They are very hardy, good layers, and extremely gentle. Any of these three can easily be turned into pets, and if you don't watch it, they might just follow you into the house if you leave the door open.

Cold-Weather Breeds

The Leghorn is one Mediterranean breed that also has standardized varieties, with smaller combs. There are Rose-comb White Leghorns, as well as well as Rose-comb Brown Leghorns. The Leghorn breed will do extremely well in cold weather, provided the combs and wattles do not freeze.

The three breeds previously mentioned — Australorps, Speckled Sussex, and Ameraucanas — are definitely winners when it comes to cold-weather survival. They are three of my favorites.

Another one of my favorites is the heritage breed, Dominique. The Livestock Conservancy recognizes these little black-and-white barred birds as America's first chicken breed. They were popular in Colonial times and moved west with the settlers. They are calm, good layers, and actually make good pets.

Other popular winter-hardy breeds are Wyandottes, Buff Orpingtons, Brahmas, Delawares, and Rhode Island Reds. Lesser-known breeds include the Russian Orloff, Chanteclers (developed in Canada and considered their national breed), and Java Fowl. Javas also do well in hot weather. The Java is not exactly rare, but is a very old breed that is unknown to many people. It has a place in poultry history, as many of the breeds we

In most areas of the United States, extreme heat conditions will do birds in more frequently than cold winter conditions. Lighter colored birds have an advantage in extreme heat, and White Leghorns, Minorcas, and more will do well.

know and love today have Java parentage somewhere in their ancestral lineage. One other historic breed that makes a good choice for cold weather is the Dorking. A little larger bird, this bird's ancestry goes all the way back to Roman times and was one of the fowls bred and kept centuries ago in England. Pilgrims likely kept Red Dorkings at Plimoth Plantation.

Many of the birds mentioned, with some exceptions, have smaller combs and larger bodies that suit them well for the cold weather. The exceptions that have single combs include Dorkings, Australorps, and Orpingtons.

Hens' combs are generally small enough to avoid severe cold-weather damage, but the cockerels' comb grows rather large and can be a candidate for frostbite. If you only keep hens, as many poultry keepers do these days, you shouldn't have too many problems. If you are concerned about frostbite, some source of heat, such as an infrared heat bulb, may be beneficial on extremely cold nights. Just make sure it is secured well so it doesn't fall or get knocked off, causing your chicken coop to catch fire.

In the event you wind up with a breed not ideally suited to your climate, make sure you have a way to keep them sheltered from climate extremes. Using things like small box fans and shading material can help dispel heat, and precautions like heat bulbs in small coops can help in severe cold. Take care and enjoy your birds! 🐔



BEST CHICKEN BREEDS FOR BACKYARD FLOCKS

Our latest survey results can help you choose the best chickens for eggs, meat, temperament and more.

By Troy Griepentrog

Chickens are the perfect starter livestock for your homestead — whether you have a small backyard in an urban area or 20 acres in the boondocks. Chickens provide eggs, meat and fertilizer, plus they're small and easy to manage. Several breed charts are available online and in books, but their information is often based on old data. So, to get current information, we developed a survey of our readers who have lots of experience with various breeds. (Many thanks to more than 1,000 readers who participated in the survey.)

The summaries below include only results from people who

have more than three years' experience raising chickens. And we only included breeds or hybrids if at least three people responded to questions about them.

Our survey didn't ask which breeds are prettiest. That's important, too, but it's subjective. If you'd like to see what each breed looks like, check out www.feathersite.com or get a copy of *Storey's Illustrated Guide to Poultry Breeds* by Carol Ekarius. It's an excellent book with outstanding photos.

Pick Your Chicks

Before you decide which chicken breeds to raise, you'll want to decide which attributes are most important to you: egg production, meat production, temperament or other qualities. If you try



From left: Cornish chickens do well on pasture or in confinement. Brahmas are calm and easy to manage. Buckeyes tolerate cold weather well.

a breed for a year or two and decide it isn't quite what you were looking for, try another — or try two or three breeds each year to find out which one best suits your needs.

After you've selected a breed, use our Hatchery Finder (bit.ly/2afQmEO) to find mail-order sources near you. Then, ask a few questions before you place your order. Breeders and hatcheries select for different traits. For example, some breeders may select Orpingtons for egg production; others, to meet a certain "type" described in a standard for shows. All birds of a certain breed won't have identical characteristics. Some people who took our survey said Javas lay dark brown eggs; others said Javas lay tinted eggs. That doesn't necessarily mean someone is wrong — certain flocks may have been bred to produce darker eggs than others.

Egg Size and Productivity

Most people who keep chickens want eggs. Based on our survey results, the most productive egg layers are hybrids, including the Hy-line Brown, California White, Golden Comet, Cherry Egger and Indian River. If you prefer heritage breeds, Leghorns, White-faced Black Spanish, Rhode Island Reds, Australorps, Rhode Island Whites, and Plymouth Rocks are good choices for producing lots of eggs.

Hy-line Browns, Golden Comets, ISA Browns, Cinnamon Queens, and Brown Sex Links (all hybrids) lay mostly extra-large eggs. From heritage breeds, you can expect the largest eggs from Jersey Giants, Australorps, Plymouth Rocks, Orpingtons, and Rhode Island Reds.

Quickest Eggs

Some hybrid pullets (young hens) start laying eggs when they're only 17 weeks old, but pullets of some breeds take more than 26 weeks to mature and start laying. If you're in a hurry to get fresh eggs on your table, consider Cherry Eggers, Indian Rivers, ISA Browns, Pearl Leghorns, and Golden Comets. Almost all Leghorns and Leghorn hybrids are quick to mature, but if you're looking for other heritage breeds, check out Red Caps, White-faced Black Spanish, Anconas, and Minorcas. Hens of these breeds can start laying at as early as 21 weeks.

Egg Color Spectrum

If one of your selection criteria is eggshell color, Marans, Barnevelders, and Welsummers lay the darkest brown eggs. (We didn't include Penedesenca in our survey because they're rare, but they usually lay even darker eggs.) Ameraucanas and Araucanas (rumpless) lay greenish or bluish eggs.

Pest Control and Free-range Ability

If you want low-maintenance chickens to clean up ticks and insect pests, most breeds are good choices. (See "Poultry Pest Patrol: Control Insects With Barnyard Fowl," bit.ly/2akf87V.) Cubalayas and Jungle Fowl rated best for hustling much of their own food, but they're not especially productive layers or meat birds.

Chickens that are allowed to range on pasture produce the most nutritious and flavorful eggs (bit.ly/2afRjg0). Other

The Price of Farm-fresh Eggs and Meat

More than 50 percent of 1,000-plus respondents to our survey use eggs and meat for themselves or give them to friends and neighbors. About 47 percent sell eggs; less than 10 percent sell meat. Many people sell eggs for \$2 or less per dozen, especially if they're only "farm fresh." But more than 13 percent of those who sell eggs that are both free-range and organic charge \$5 or more per dozen.

More than a quarter of those who sell pasture-raised meat charge between \$2 and \$3 per pound; another quarter charge between \$3 and \$4 per pound. About 15 percent of those selling organic chicken charge \$4 to \$5 per pound, and 16 percent of those selling heritage chicken charge more than \$5 per pound.





From left: Bantam Modern Game rooster, White-faced Black Spanish rooster, Orpington rooster. Orpingtons are calm, dual-purpose chickens.

breeds suited to this environment are the Catalana, Old English Game, Hamburg, Minorca, and Malay. But if you have limited space, you might consider Houdans, Pearl Leghorns, Langshans, Cornish, and Polish — all of which ranked highly as living equally well in confinement or on free range.

Least Likely to Get Their Hackles Up

Some breeds, such as Leghorns, are productive egg layers, but they're also nervous (or "flighty"). Especially if you're just starting to raise chickens, you might want birds that are calm and easy to manage, such as Silkies, Cochins, Faverolles, Orpingtons, or Brahas.

Temperature Tolerance

When you're selecting chicks in spring as the weather is warming, the following winter may be the last thing on your mind, but planning early will make your flock healthier and daily maintenance easier. Breeds that tolerate cold weather best are Chanteclers, Buckeyes, Brahas, and Javas. In some locations, heat is a bigger concern than cold. Breeds best suited to hot environments are Jungle Fowl, Malays, Sumatras, Javas, and Cubalayas.

Best for Natural Incubation

If you want hens that are naturally adept at hatching and raising chicks, top choices include Silkies, Aseels, Modern Games, Old English Games, and Cochins. Most hens with an inclination

to hatch eggs make excellent foster mothers, too: They'll hatch eggs from other breeds you raise. The tendency to "go broody" (decide to hatch eggs) has been bred out of many breeds because hens stop laying eggs for an extended period of time when they're broody — even if they're not hatching eggs.

Meat Quality

We asked two questions about meat production: "How useful is each breed as a meat bird (mature size, growth rate, feed efficiency)?" and "How would you rate the flavor of meat of each breed (compared to supermarket chicken)?" Cornish, Buckeyes, Rhode Island Whites, Orpingtons, and Plymouth Rocks were rated most useful as meat birds. All hybrid meat chickens should grow quickly and convert feed efficiently, but they develop so quickly that they often suffer health problems.

The chickens with the best flavor are La Fleche, Buckeyes, Dorkings, and Cornish. All people who rated La Fleche said it has "very good flavor" (the highest rating). No breeds or hybrids were consistently rated as having "poor" flavor.

I Want It All!

The breeds with the highest overall scores (including temperament, maturity, cold and heat tolerance, egg production, egg size, meat utility and meat flavor) are Rhode Island Whites, Plymouth Rocks, Orpingtons, Australorps, and New Hampshires — all dual-purpose, brown-egg-laying breeds. 🐔



From left: Bantam Araucana rooster, La Fleche hen, bantam Leghorn rooster. If you want particularly tasty meat, the La Fleche breed is a good choice.



BREED BETTER HERITAGE FLOCKS

Many commercial hatcheries focus only on hybrid chickens and fail to maintain good quality in the heritage breeds they offer. Here's why and how dedicated 'flocksters' can take breeding back under their wings.

By Harvey Ussery

Many of us who keep backyard flocks are aware that industrial chicken breeds from commercial hatcheries aren't the best option if we're hoping to raise self-reliant birds.

We prefer sturdier, heritage chicken breeds, capable of free-ranging and foraging much of their own feed. We want breeds that retain natural resistance to disease and climate stresses.

We "flocksters" often prefer to harvest meat and eggs from the same flock, so

we're more interested in dual-purpose breeds than in industrial hybrids with either astounding laying or growth rates.

To meet those goals, we choose to raise heritage chicken breeds, expecting they'll offer the traits that made such breeds popular on homesteads for generations, including longevity, the inclination to forage, immune system integrity, and, of course, reliable production of high-quality meat and eggs.

But industrial breeds are responsible

for such a large proportion of the commercial hatcheries' business that the rearing of heritage breeds has fallen by the wayside. Many heritage breeds have lost the qualities they were originally valued for.

I propose that we homesteaders and small-scale farmers take heritage chicken breeding into our own hands, and that we support the improvement-breeding efforts of any and all farm-scale hatcheries.



Not All They're Cracked Up to Be

The poultry industry has proved quite capable of breeding for the select traits it wants to improve. The most dramatic changes began with the 1948 national “Chicken of Tomorrow Contest,” which challenged producers to grow the largest birds in the shortest amount of time.

Traditional chicken breeds would reach market weight by 14 weeks of age or older, but through intensive, selective breeding, modern commercial broilers can reach market weight at only 5 or 6 weeks of age.

Such marvels, however, are bred to conform to confinement in climate-controlled facilities and an exclusive diet of highly processed, manufactured feeds. These extraordinarily productive chickens resulted in cheaper meat and eggs, but the effort came with a cost.

Several studies have found that rapid growth in commercial broilers affects the immune systems of the birds, as their genes cause them to allocate more resources for growth and provide fewer for immune response. Their immune systems have weakened over generations because hardiness is not a concern for breeding selection; instead, industrial



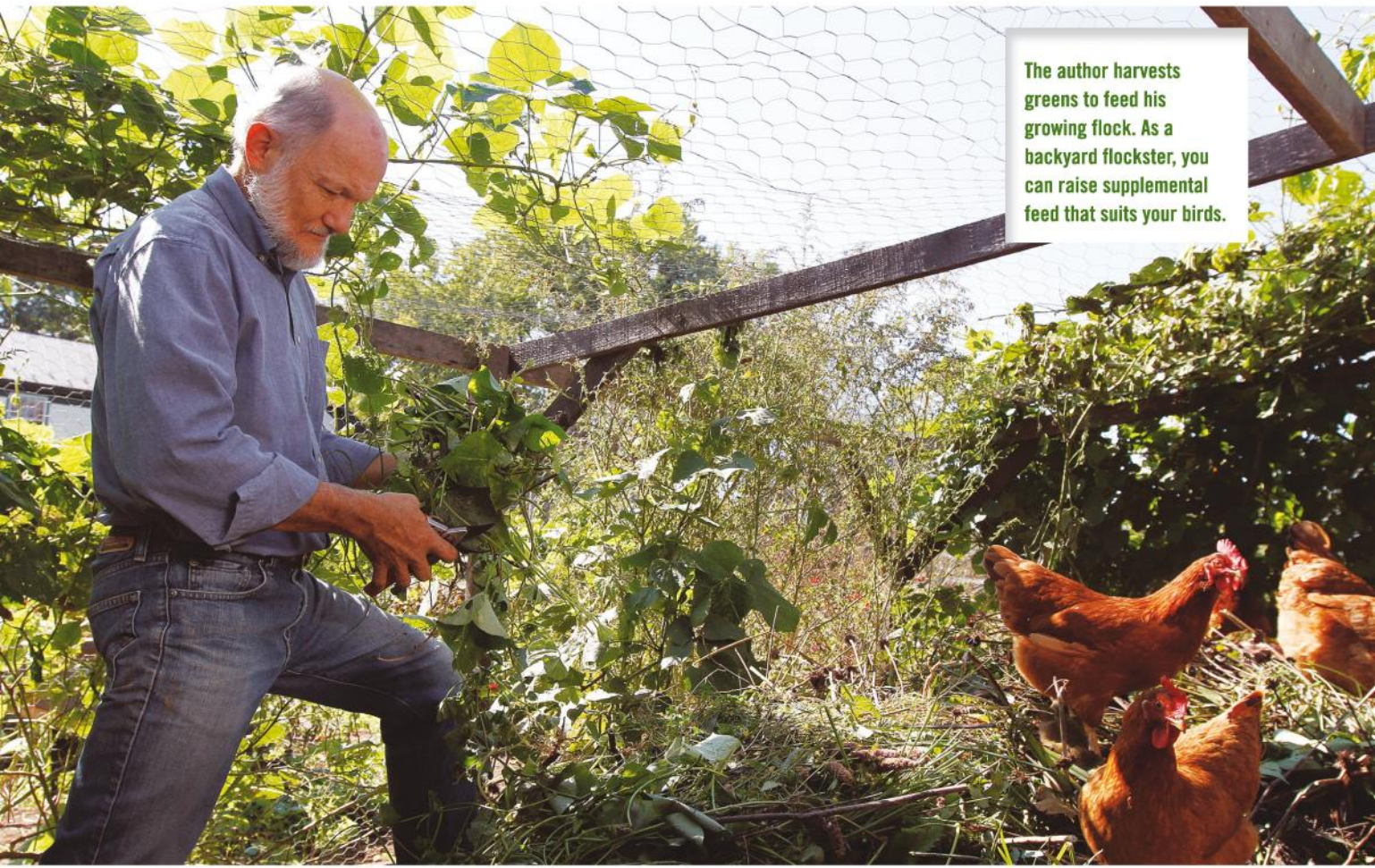
Ideal examples of the Delaware (left) and Buckeye (right) breeds from The Livestock Conservancy.

flocks are routinely fed antibiotics to promote growth and ward off illness.

The poultry industry’s focus on only a few supercharged hybrids has meant that other breeds haven’t been rigorously selected and have declined in numbers. Unfortunately, even flocksters seeking traditional, well-rounded chicken breeds are likely in for a rude surprise when they order a batch of

Wyandottes, Plymouth Rocks or other heritage chicks from commercial hatcheries. Far too often, the chickens raised from those chicks don’t measure up to the owner’s expectations based on breed descriptions established by the American Poultry Association’s Standards of Perfection.

A good example is my own experience with Delawares. My research promised



The author harvests greens to feed his growing flock. As a backyard flockster, you can raise supplemental feed that suits your birds.



While all chicks are cute, you should choose only a small percentage of each generation to breed.

that Delaware hens would be excellent layers that would maintain egg production well in winter, and that both males and females would grow rapidly enough, and to a good enough size, to

make quality meat chickens as well. Imagine my disappointment when my chicks matured at only moderate rates to a rather small size, and when the hens turned out to be mediocre layers.

My trials of other heritage breeds yielded chickens that were serviceable enough but still didn't meet the breed descriptions.

Why is hatchery stock for traditional breeds of such mediocre quality? Jim Adkins, founder of the Sustainable Poultry Network-USA, worked for years in the poultry industry before despairing of its exclusive use of hybrids bred for confinement. He explains that large hatcheries routinely practice "flock mating" — that is, they randomly set aside as many breeding hens and cocks as they need and allow them to mate willy-nilly. Over time, the quality of the stock declines. While the resulting flocks retain the appearance of their ancestors, they increasingly perform as "generic chickens," weak in the utilitarian traits these breeds once offered.

The Missing Ingredient

Missing from the common industrial breeding approach, which almost guarantees a decline in quality,

You can pasture many heritage breeds in predator-proof, movable pens.



is rigorous selection of superior individuals as breeding stock.

Contrast the “flock mating” approach with the method Don Schrider and Jeannette Beranger of The Livestock Conservancy used in their “rescue” heritage chicken breeding project with the Buckeye. This hardy, dual-purpose North American breed was developed in the 1890s, and it had almost reached extinction when the breeding project began in 2006.

Schrider obtained eggs from three unrelated private flocks, from which he hatched about two dozen chicks to start. He and Beranger tracked birds individually and kept meticulous records to ensure only unrelated hens and cocks mated. The following year, they hatched 250 chicks, and they hatched 300 the year after that.

Each year, Schrider and Beranger selected superior individuals to mate using the “best 10 percent rule,” meaning they chose only the best chick out of 10 to breed the following generation.



The author's Icelandic birds retain the ability to successfully scavenge for scrumptious morsels.

Beranger and Schrider aimed to enhance the meat quality of the Buckeyes. They weighed the birds at 8 weeks, 12 weeks, and at their target slaughter age

of 16 weeks. Weight was only one of the selection criteria — they also measured skull and back width, heart girth, and other physical characteristics associated

with fast growth and large carcass size.

Within three generations of careful improvement breeding, The Livestock Conservancy's Buckeyes increased an average of 1 pound and reached the desired weight in 16 weeks rather than the original 20.

Only the Best for the Nest

Many experienced flocksters may be surprised to learn how easily they can organize a breed-improvement project, even at the home flock level. Certainly the numbers required to mount a serious project are well within reach of any small farm serving local markets.

In my own project, I aim for a breeding flock of 36 hens and six cocks (two males and a dozen females in each of three "clans").

Breeders who have applied the basic principles followed in The Livestock Conservancy's project have proved the method's success with other heritage breeds as well.

Successful breeders have accepted

as fundamental the need to cull stringently. Maryland breeder Will Morrow started his line of Delawares with 250 hatchery eggs and, within two generations, brought his stock from about 15 percent below breed-standard weights up to the standard (7.5 pounds for cocks, 6.5 pounds for hens).

Egg production also increased. In the first year, Morrow kept only 10 percent of the initial 250 birds to serve as breeding stock. Since that time, he's retained only the best 5 percent of cockerels and 20 percent of pullets.

The culled birds provide the family's meat or are sold at market.

Does culling this severely seem extreme? Remember, for any wild species, nature is a ruthless "culler."

We do our best to protect our flocks from predators, but if we aspire to breed for improvement, we must assume the role of the predator by removing all less-fit individuals from the gene pool and allowing only the superior birds to reproduce.

Environmental challenges play a role in selection as well.

When Andrew Christie was breeding his unique, cold-hardy strain of New Hampshires in the 1920s, he kept his birds in pasture shelters through harsh New England winters and bred only the hardiest. The environmental challenge where I live in the mid-Atlantic is more likely to be hot and humid summers, so I cull any bird that wilts in those conditions. The culls serve as my family's table chicken, so we don't need to raise a separate "meat flock" from our "layer flock."

I also always eliminate immune system weakness. Any bird that shows signs of illness is culled immediately, no exceptions. If this seems brutal, I ask: How much more cruel would it be to saddle future generations of my flock with a disposition toward illness?

Despite a goal of effective, strict culling, not all breeders can generate enough chicks to follow a literal best-10-percent rule every season.

I've found, for example, that hatching more than six dozen chicks per breeding season would be impractical for me. While keeping only 10 percent of male

chicks is easy enough (as one cock can service multiple hens), the percentage of pullets I need to keep as replacement breeding hens is more likely to be 40 percent. Though my level of selection should ideally be more severe, it will have to suffice, with the trade-off that my improvement goals may take longer to accomplish.

A Flock Fit for You

What should we be aiming for as we cull our flocks?

With careful selection, we can each enhance whichever utilitarian traits are most important to us. Breeding our own chickens is analogous to saving our own garden seed.

Intelligently selecting breeding stock and managing matings can result in a uniquely adapted flock with better health, hardiness and production that's ever more finely attuned to our own conditions, management practices and production goals.

I've been raising Icelandic chickens exclusively and breeding all of my own stock for three years (read about this project at goo.gl/tfBRzq). "Icies" are a landrace rather than a tightly defined breed, characterized by genetic and visual variability, and I select first of all to retain that variability. They are hardy and robust, adept at evading predators, and skillful at foraging much of their own feed if given range. I select to enhance all of those traits as well.

I hatch using natural mothers exclusively, and I like to hatch early in the season in one big wave, so I select for early broodiness and mothering skills.

Good egg production is also important, so I favor the better laying hens, especially those that maintain good production in winter. (Flocksters most interested in improving egg production may consider investing the extra effort required to use a trap nest to track egg size and laying rates of individual hens. This would make selecting the best layers easier and more accurate.)

Set Up a Mating System

It's important to choose a mating system that maintains the maximum genetic diversity possible, which will

Find Heritage Chicks

When you're considering a source of breeding stock, question potential suppliers carefully about their breeding goals and practices. Buy from chicken breeders dedicated to the purity of their stock and to its improvement through knowledgeable breeding.

The Livestock Conservancy: Maintains an interactive Breeders Directory; goo.gl/qFX2wT.

Society for the Preservation of Poultry Antiquities: Publishes a quarterly newsletter and an outstanding Breeders Directory; \$15 annual membership; contact Charles Everett, 1057 Nick Watts Road, Lugoff, SC 29078; crheverett@bellsouth.net; 803-960-2114.

Sustainable Poultry Network-USA: Maintains a list of certified farms, many of which sell chicks; www.spnusa.com/certification.html.



When you breed your own flock, you can choose which traits to select for, such as cold-hardiness.

ensure the best chance that traits needed for our birds to thrive with our conditions and management practices, and to meet our production goals, will be expressed in some of the offspring.

We must strictly avoid too much mating of individuals that are too closely related. While mating closely related birds with great care can have good results, allowing a lot of random sibling and half-sibling matings year after year is certain to lead to inbreeding depression, which is a decline in vigor and performance resulting from heightened expression of negative recessive traits.

We can choose from a number of mating systems, ranging from simply bringing in unrelated cocks from trusted outside flocks each breeding season, to complex pedigree systems requiring close tracking of every mating of every individual. Because I prefer to maintain a closed flock and don't have the patience for the detailed record-keeping required in a pedigree system, I assign birds to clans, and then manage the mating between clans in an invariable pattern.

If you're interested in my system,

learn how it works at www.motherearthnews.com/clan-breeding.

Small Farmers as Leaders

The speed at which breeders can improve average stock, as shown in the breeding projects described earlier, is impressive. Betterment can happen quickly because the basic genetics for superior performance are already there from earlier generations.

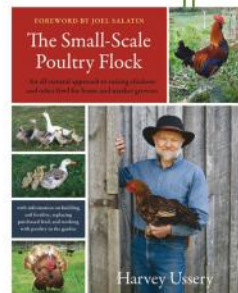
A serious breed-improvement project may be a stretch for many homestead flocksters, but cooperatively organized projects are certainly possible. Several backyard breeders dedicated to improving a heritage chicken breed might each keep a part of a flock that they manage, for breeding purposes, as if all of the small flocks were a single, large flock.

Almost all farmers supplying local egg and broiler markets, however, deal with flocks large enough to allow for the stringent selection required to breed for better performance. Small farmers really do have the option of breeding unique strains of their preferred heritage market breeds that are superior to stock available for those breeds anywhere else.

These chicks and hatching eggs could even be a marketable product to sell to other farmers or backyard flocksters.

I imagine that many small-flock owners reading this article agree on the need for better breeding, but simply can't commit to a breed-improvement project. If that's true for you, support the breeding of improved strains by purchasing your chicks or hatching eggs from those who are doing this important work. Refer to "Find Heritage Chicks" at left for recommended sources of heritage breed chicks. 🐔

Backyard flockster Harvey Ussery breeds his hardy, multicolored Icies and maintains his website, www.themodernhomestead.us, in Virginia. He is the author of *The Small-Scale Poultry Flock*, www.grit.com/store.





Fermentations for the Flock

By Susy Morris

Improve your poultry's health while saving money at the feed store.

Many of us have heard about the benefits of adding fermented foods in our own diets, including reduced risk of sickness, better nutrient absorption, and higher digestibility, to name just a few. The same is true for your poultry flock and other animals.

Fermenting feed for your flock is actually very easy, and the benefits range from increased egg production in winter to lower feed consumption.

When I first inherited a flock of chickens, I fed them organic chicken pellets from the local feed store. I liked the convenience of filling a feeder once a week and not having to think about it. Then I added ducks, turkeys and guinea fowl, along with more chickens. That's when I started to think about ways to increase the health of my flock and decrease my feed bill.

I found a source of inexpensive whole grains from local farms and began researching feed-mix ratios and digestibility. In my search, I turned to vintage livestock books, which are a wealth of information for any of us who want to step away from the premixed livestock feed industry.

My interest was piqued when I found frequent mentions of soaking, sprouting and souring grains before feeding them to livestock.

The Nitty Gritty

The main reason to ferment chicken feed is that it improves our birds' health. Probiotics help fight off sickness and help gut health, and studies have shown that birds fed fermented feed are less susceptible to salmonella and campylobacter. In fact,

the amounts of these two types of bacteria in particular were shown to be lower in the digestive tracks of birds fed fermented feed, something important to those of us who raise birds, especially meat birds, and particularly if we process them on-farm.

Beyond the health aspect of fermenting feed, it is beneficial simply for economic reasons. Soaking or fermenting feed softens the grains, making it easier for the birds to digest and nutrients more readily available, thus reducing feed intake. The wet feed is also more palatable to birds, thus reducing feed waste, especially when it comes to commercial feed mixes.

My birds eat about 25 to 30 percent less when fed soaked or fermented feed. This really adds up when you're feeding between 50 and 75 birds, and it's still a valuable savings even if you have only a small flock.

Not only does fermenting feed reduce intake, it also increases weight gain, egg production, and egg weight. I noticed in my flock that egg yolks were larger, and my customers also noted the change. In fact, my customers swear that the eggs taste different than eggs they purchase from other small producers feeding similar, yet unfermented feed.

In addition to reduced feed intake, fermenting feed increases the availability of vitamins and minerals in the feed.

Phosphorus and protein availability increases, and sugar levels decrease. This increase in protein absorption, though seemingly small, helps us save money, because a cheaper, lower-protein feed can be used, which is especially helpful if you raise

broilers and turkeys. In fact, my broilers and turkeys are raised on the same grain mix that my layer flock eats. Technically it has 14.5-percent protein content, but with fermenting, it is increased by about 3 percent. This may not seem like much, but it is enough that I don't have to add extra protein for the meat birds.

If you are feeding a whole-grain mix, fermenting is even more important because it neutralizes phytic acid present in whole grains. Phytic acid acts as an anti-nutrient and blocks absorption of a variety of vitamins and minerals.

According to a study in *British Poultry Science*, hens fed fermented feed started laying later than hens fed dry feed, but their eggs were heavier when they did start laying. The study also found that the birds themselves weighed more (note to those using fermented feed for meat birds), and feed-to-egg ratio and shell thickness was better in the fermented feed group.

In my experience, birds also lay much better throughout the winter. In fact, many of my local chicken-keeping friends started fermenting their feed when they noted how many eggs I was getting during our long Maine winters compared to the number of eggs they were getting with dry feed.

Mix and Mash

At this point, you're probably wondering how much time and effort it's going to take. Fermenting feed couldn't be easier. Simply add feed or grain to a container, cover with water, and let it sit for 24 hours to a week. That's all it takes.

You can ferment home-mixed feed, like I do, or store-bought feed. The consistency of the end product will be different, but the results and benefits are the same. Fermented pellets or mash will have the consistency of porridge, whereas the fermented whole grains I feed are fairly dry.

To start fermenting, you'll need some food-grade containers. Some people say not to use metal, but I use a 16-gallon stainless steel stockpot and 5-gallon food-grade plastic buckets. Half-gallon Mason jars are perfect if you're fermenting for a small flock. Fermentation can create an acidic environment, so food-grade containers are very important. There's no reason to risk chemicals and toxins leaching into the feed from using plastics that aren't food-grade.

Choose a warm location that's convenient and can get dirty. I ferment on my south-facing



Fermented feed is easier to digest, which means more nutrients for your birds and less money spent at the feed store.



The process of fermenting feed is simple: Choose your favorite grain or feed mix, and soak in water for one day up to a week.

screened-in porch in the summer, and by the woodstove in the kitchen during winter. Both areas are easy to clean and warm enough to keep fermentation going. Fermentation occurs faster at warmer temperatures. Mine ferments quite quickly in the summer on the warm back porch, and in the winter it slows down.

Make sure the location is convenient to your feeding area. Fermented feed is heavier than dry feed because of the additional liquid, and having access to water is also a consideration.

After choosing your location, fill containers about two-thirds full of feed, then cover with water to about 1 inch above the feed. If using chlorinated water, I recommend allowing it to sit in an open container for 24 hours before adding to the feed, as the chlorine can affect fermentation rates. If you have well water, you can add it right away. You may need to add more water after 12 to 24 hours, depending on how much liquid your feed absorbs.

Keeping the water level above the feed or grain helps reduce the risk of mold.

Allow it to set a minimum of 24 hours and a maximum of five to seven days, depending on temperature and fermentation rate.

If you have liquid left over from a previous batch, you can reuse it to help kickstart the process. That liquid is filled with natural yeasts, and fermentation will occur much quicker. Stir daily and watch for signs of fermentation.

The feed should have a pleasant sour, yeasty smell, like sourdough or bread dough. You may notice bubbling after a day, and that's perfectly normal. You may also notice a whitish film forming on the top. This is also perfectly fine, as it's natural yeast. Some people recommend adding apple cider vinegar to the feed, but I prefer not to. I find my feed acidifies nicely on its own, and I want to allow the natural yeasts to thrive. Feel free to add a tablespoon or two if you'd like. Perhaps you can



experiment and see if it improves fermentation and the health of your birds. All feeds and mixes will ferment a little differently.

You can start feeding soaked feed to your birds after 24 hours, but optimal benefits are reached between three and five days of fermentation. Seven days is about the maximum you want to let food ferment unless it's very cool and fermentation is slow. If feed develops mold on top (fuzzy green growth), skim off and smell the feed. If it still smells yeasty and acidic, it's fine to feed to your birds.

Do not feed any moldy feed. If your feed develops a rotten or putrid smell, do not feed it to your birds. Compost it, and try again. Sometimes larger grains, sunflower seeds in particular, like to float to the top of the mix and have a tendency to mold. Stirring more than once a day will help reduce the risk of mold forming on top of the feed.

Feeding Frenzy

When giving feed to birds, try not to feed more than they will eat in one day. Wet feed will mold quickly when left in a trough, especially in warmer climates. I feed as much as the birds eat during a day with minimal amounts left in the evening. Sometimes they leave some, but usually it's gone the next morning before I get out to the coop.

I use the bottoms of old feeders, wooden troughs, and large plant saucers for the wet feed. I find a rectangular wooden trough to be ideal, as it

provides access to a larger number of birds at once. It's also wise to rinse out feeding pans on occasion if the birds don't pick them clean.

Fermented feed can pose a few difficulties during the winter months when temperatures dip below freezing, and the feed can freeze. I feed a small amount in the morning and another small amount in late afternoon before the birds roost up. When temperatures are extremely low, I put the feeding bowl on a seedling heating mat to keep the feed from freezing before the birds can eat it.

Generally, fermented feed doesn't need additional heat unless it's extremely cold. Here in Maine, that's only a week or so during the winter.

In the summer, I wait and feed my flock in the evenings. This encourages them to spend all day foraging. They also do a better job of gobbling up all the fermented feed when they're hungry.

Fermentation is not just for fowl either. You can ferment feed for other animals and livestock. All animals and humans on our farm eat at least some type of fermented food on a daily basis.

As with most farm chores, it will take a little experimentation to find the process that works best with your setup and schedule. It may take trying a few different methods, brands of feed, and feeding containers to find the ideal method for your flock.

Once you find what works best for you, you'll notice healthier chickens and a smaller bill at the feed store. 🐔

Feeding meat chickens a diet of fermented grains increases weight gain. Layers also produce heavier eggs with thicker shells.



Summer Success for the

Flock

Keeping chickens during hot and sticky days can be tricky, but follow these guidelines, and your birds will make it just fine when temperatures soar.

By Melissa Caughey

Believe it or not, in most cases it's more difficult to care for chickens during the blazing heat of summer than it is during winter. Unlike us, for the most part chickens seem to take winter in stride. However, during the intense summer heat, you may notice that your chickens eat less, drink more water, and lay fewer eggs. These are just a few of the things that can happen during soaring summer temperatures. This article will focus on how chickens cool themselves, how to recognize heat stress, techniques to keep your backyard flock cool, summer nutritional needs, free-ranging tips, composting suggestions, and we'll even touch on gardening with chickens.

How Do Chickens Keep Cool?

Chickens do best when the outside temperature is between 65 and 75 degrees Fahrenheit. This is the optimal temperature for chicken health, egg laying, and brooding eggs and chicks.

Chickens maintain an internal body temperature of around 106 degrees Fahrenheit.

Chickens maintain this body temperature using a few intrinsic techniques.

There are cold-hardy chicken breeds and heat-hardy chicken breeds. The biggest difference between the two is the size of their combs and wattles. Size does matter when it comes to combs and wattles, as this is one way that chickens regulate their body temperature.

Larger combs and wattles allow the chicken to cool their body more readily. The combs and wattles help cool the blood. As blood flows through the comb and wattle, it is more closely exposed to the temperature of the environment.

This technique works well for some chickens, but what about those cold-hardy chickens with smaller combs and wattles? Chickens have a couple more cooling techniques.

Unlike us, chickens do not rely on sweating to cool their bodies. Instead, they use evaporation via their respiratory system.

As water vapor from the chicken's lungs and air sacs is exchanged into the air, the bird is able to cool itself. Humans evaporate sweat from our bodies to cool; chickens evaporate water from their respiratory system.

When chickens are overheated, they begin to pant. This is often the first sign of heat stress. Panting not only increases the resting breathing rate but also the rate of water evaporation from their lungs. You might notice that because of this, chickens drink more on hot summer days.

It is important to realize that when the humidity level in the air is over 50 percent, it is more difficult for chick-



Heat Stress

When a chicken is unable to cool its body, and its internal temperature rises to around 115 degrees Fahrenheit, the chicken is in danger of perishing from the heat. Chickens severely stressed by heat will pant rapidly, their mouths are open, their wings are held away from the bodies, and they can even sometimes be found squatting on the ground.

ens to perform this cooling function because the atmosphere is already quite saturated with moisture.

Chickens also keep cool by holding their wings away from their bodies. The undersides of the wings are less feathered. Lifting the wings allows trapped heat to be readily released. Lift-

ing the wings usually happens in conjunction with rapid panting. This can be a sign of worsening heat stress. Heat stress can be fatal if changes are not made to the flock's environment.

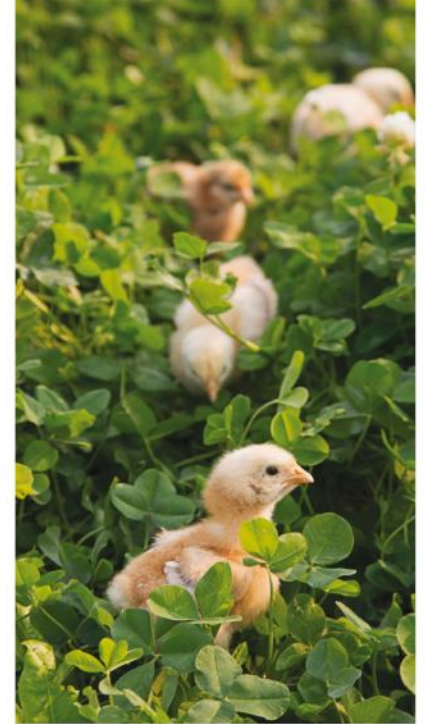
Cooling the Flock

The good news is that it is not difficult to keep your flock cool and comfortable even on the hottest of summer days. One of the easiest ways is to provide shade. When selecting a spot for your chicken coop, keep in mind tree shade is not only beneficial to help keep the chicken area cool but also can offer some coverage from aerial predators. It is also a good idea to cover the run for shade too. If your run was not built covered, you can provide some degree of shade by simply draping a sheet or tarp over it. You will find that chickens tend to dust bathe in the summer in the cooler soil found in shady spots. Dust bathing can be cooling.

You will also notice that chickens prefer to spend their time outside the coop. Sometimes the coop can be hot. This is not optimal when it comes time to roost in the evening. It is a good idea to have a thermometer inside and outside of your coop, so you can keep an eye on the effectiveness of your cooling efforts.

To keep the coop cool, be sure there is adequate ventilation. Operational windows are an added bonus. In addition to good airflow, remove chicken drop-





pings promptly, as they are a source of heat.

A thinner layer of chicken bedding should be used in the summer compared to a thicker layer during winter. Circulating fans can also be added to help keep the flock cool. Plus they help keep flies and mosquitoes away.

Keep the yard foliage and grass around the coop from growing too high, as this can curtail good airflow. Short, trimmed grasses and plantings are best around the coop and run.

Misters in the backyard are also helpful. In addition, some chicken keepers add frozen jugs of water to the coop to help drop the temperature. Chickens can sometimes be found sitting surrounding these frozen bottles of water. Wading pools with ice and cool water are also great at helping to beat the heat.

Summer Nutrition

You may notice that your flock eats less on those hot summer days. This is normal. During sweltering temperatures, chickens consume larger amounts of water. This is in an effort to keep cool. Chickens should always have generous amounts of clean, fresh drinking water. Adding vitamins and electrolytes to the drinking water can also be helpful for chickens during the heat. This helps them to rapidly replenish their internal stores.

Some nipple varieties of chicken waterers are attached to coolers. Try adding some ice to the cooler's water and keep it chilled all day long.

As chickens generally tend to eat less during the day, be sure to provide them

Heat stress & Egg Production

Heat stress in the flock can be responsible for a decrease in egg laying, egg size, hatch rates, overall egg quality, as well as thin eggshells. As chicken eggs are almost 80 percent water, chickens will defer egg production in favor of efforts to cool their body through the evaporative process we discussed earlier.

with a quality commercial chicken feed. Probiotics and prebiotics can be helpful in maintaining your chickens' digestive health.

Keep in mind the simple act of digestion generates heat.

Feed your flock during the cooler times of the day, whether it is in the early morning or evening. In addition to providing commercial chicken feed, some like to treat their flock to fresh melons and treats from the garden. These all have varying degrees of water content that helps restore their temperatures.

Consider cutting back on feeding your flock scratch and cracked corn during extreme heat. These tend to have less nutritional value but still generate heat. Better nutritional choices during this time help to keep your flock healthy and their immune systems strong.

Sometimes, as chickens consume more water, you may notice that their manure becomes more watery. This is normal. Just be sure to distinguish watery manure from diarrhea. Diarrhea is an indication that something is wrong.

Free-Ranging: Room to Roam

Chickens should not be overcrowded for a variety of reasons, but this is especially true during the summer heat. Free-ranging the flock can be beneficial, as the flock is able to choose where they are most comfortable as opposed to being confined in the coop and run. Supervised free-ranging is encouraged to help curtail attacks from predators.

The birds will utilize misting stations attached to garden hoses as well as hangout spots beneath shady plantings. Chickens tend to be less active during the intense heat of the day, preferring to seek out cool shady spots. It is important to let your birds rest. It is not the time to chase them around the yard or try to engage them.

Predators

Poultry predators are present year-round. Chickens can be attacked by aerial predators such as birds of prey or predators from the ground including fox, coyotes, raccoons, opossum, snakes, mink, weasels, fisher cats, and even neighborhood dogs. However, most people do not think of poultry mites, lice, worms, and even flies as predators.

Chickens are susceptible to a variety of chicken mites and lice. Their presence can peak during warmer temperatures. It is important to regularly inspect your flock for these blood-sucking insects. Infestations large enough can lead to anemia and even death.

Inspect the coop's roosts and nesting boxes too. If you discover poultry mites or lice, both the flock and the coop should be properly treated. Houseflies can also pose a danger called "fly-strike." Keep the chicken area tidy and clean and minimize flies hanging around your flock.

Worming your chickens should never be done during the summertime heat, as it can be stressful for the flock. Worming is typically done in the spring



or late summer or fall during nonmolting periods. Prior to worming your flock, it is recommended a veterinarian check their poop for worms. You may find that your flock does not have worms at all, and you can skip worming them entirely.

Goodies From the Garden

Sharing extras from the garden is also a fun way to supplement your flock's diet with vitamins and minerals. Pesticide-free grass clippings are a fantastic source of omega-3 fatty acids. Discarded beet tops, carrot tops, old broccoli, and cauliflower plants are also welcomed treats tossed whole into the run. Tomatoes and squash filled with bugs are simply an added bonus when it comes to treating your chickens.

Try planting a garden just for your flock around the coop. Chickens love to eat veggies, herbs, fruits, and berries.

Whether you share a container garden or treats from your own garden, your flock will reap the benefits. I have plenty of tips on gardening with chickens on my website, www.tillysnest.com, to help get you started.

Composting Manure

Summertime is the best time to create wonderful compost from your chicken manure. Following the traditional 3 to 1 ratio of brown to green, chicken manure and pine shavings seem to create that perfect ratio. Chicken manure cannot be applied directly to the garden, but under the right conditions, can break down within three to six months of composting. Chicken manure composted from spring to summer adds an extra boost of nutrition to the garden and can even be applied in the fall for springtime planting. 🐔



Caring for Chickens in WINTER

Tips and advice to help make cold weather more bearable for your flock.

Cold Weather and Chickens

By Laura Damron

We have basically two different kinds of winter weather here in the Pacific Northwest, and each presents its own unique challenges with regards to animals. Here are a few things I find helpful in keeping my chickens in good shape through the colder months, no matter what kind of weather rolls in.

Dry Bedding. This is probably the most important thing, in my opinion. I make sure I always have a bale of wood shavings on hand in the coop through the winter. I'll toss a few handfuls down under the roosts each morning when I open things up for the day, to help absorb moisture and odors from the night droppings, and as part of my deep-litter maintenance. I also add some, when needed, near the door to the run to help minimize the mud that gets tracked in.

VetRx. This is a great product that can be used in a number of ways, according to the package directions. I keep a bottle in the coop, and about once a week I put a few drops on the roost bars in the evening. This way, the birds can breathe in the essential oils while sleeping for the night. The idea is to help keep their respiratory systems in good health — I'd rather go the prevention route than deal with illness. I believe the oils are also a mite repellent, too, so if you have issues with mites in your coop, check it out.

Apple Cider Vinegar.

Whether homemade or store-bought, live apple cider vinegar — the kind with the mother in it — is a probiotic powerhouse. A tablespoon or two in the gallon waterers each day keeps their digestive systems in good working order — and it keeps the slime down in the waterers themselves.

Soaked grains. Once a week or so, I'll soak a cup or two of their scratch grains overnight in some water — about twice as much as the grains. If the weather has been particularly gross, I'll add a tablespoon of either ACV or whey from yogurt to the soaking liquid. Again, all I'm really doing is boosting their probiotic intake — friendly bacteria and yeasts — and getting some extra nutrients into their systems. Since they're not out foraging as much as they do in summer, I feel it's important to supplement their diets whenever possible.

Protein. Along the lines of supplementing diets, chickens are omnivores, and they need protein to keep everything functioning at optimal levels. When winter rolls around — particularly during freezing spells — bugs and worms are scarce, so things like canned tuna, canned pet food and table scraps can come in handy if the birds look like



they're starting to drag a bit.

My girls go bonkers for tuna, in oil, no less, with some dry rolled oats mixed in. Meat scraps, chopped up nice and small, are great as well. The chickens always appreciate extra protein. (As an aside: I don't feed my chickens chicken. They'd totally eat it, but the idea is just weird to me, so ... no.)

Ventilation. If it's not windy, I'll open one or both of the windows in our coop every morning. If it's particularly cold, I'll make sure to close them up ahead of sunset so the coop can build up some heat before nightfall, but by and large I want to keep the air flowing through the coop as much as possible, to make sure things are staying dry inside. Chickens, depending on the breed, can withstand some pretty cold temperatures, but excessive moisture in the air or on the

bedding can cause issues like frostbite on combs. Even with both windows closed on our coop, we still have covered openings in the roof that allow air to circulate to help keep things dry.

At the end of the day, it's not a lot of extra work, nor is it anything too difficult. I find that taking a few extra steps this time of year keeps everyone happy and healthy through the chilly months, and that's a fair trade, if you ask me.

Keeping Chickens Healthy in Winter

By Leigh Schilling Edwards

It's cold — very cold — in many areas of the United States and Canada right now, and people are always asking what measures need to be taken to protect their chickens through this arctic insanity.

The answer I give them is simple: "Not too much."

As humans we tend to humanize our critters, thinking that if it's too cold for me, it must be too cold for my livestock. Too often we fail to note the massive physical differences and coping styles of our animals and ourselves.

Put quite frankly, as *Homo sapiens*, we are physically one of the most bizarre and unlikely protectorates of the animal kingdom. While other animals have been granted a wide array of survival skills, instincts and automatic seasonal wardrobe changes, our own biggest asset is intelligence. And as great as intelligence is, it alone does little to keep us warm in a hostile environment.

So, what do you need to do for your chickens? The following advice is for flocks of fully feathered, mature, and healthy birds.

Ventilation. Ventilation is of utmost importance when temperatures drop into the "Oh sweet Mary and Joseph, it's COLD" range. Do NOT close up all the windows and vents, though. You need to leave something open.

Open windows and vents in this cold? Yes! The reason ventilation is so important is to avoid frostbite. You see, any living critter that breathes will release moisture into the air, and if that moisture can't escape, it becomes a problem.

A visual example of this is the



defrost setting in your vehicle. On a cold or wet day, what happens if you forget to put the defrost setting on? Your windshield fogs up. This is caused when the heat and moisture you exhale condenses on the colder surface of the windshield.

The same thing happens in your barn or chicken coop. Think of those windows or vents under the eaves as your coop's defroster. These vents allow the moisture to escape. If the moisture can't escape, it will condense on the warm, exposed comb and wattles of your chickens, and it will freeze there — and this causes frostbite. So always make sure your coop has proper ventilation.

Dodge the draft. You want your ventilation to be above the level of your birds, because moisture rises. You want to let the moisture escape, but you do not want open windows or vents at the same level as your birds. This is the wind chill factor thing at play. When it is frigid outside, that wind just intensifies the "oh-my-land-I'm-miserably-uncomfortable" factor in a big way.

If your birds are housed in a structure with a lot of gaps in the walls, consider creating a wind block at roost level by stapling or nailing up some empty feed



bags, tarps, or plastic on the inside walls of the coop. Don't worry too much about the areas below or above where your birds roost, but make sure the roost area itself is well protected from drafts.

Water. You need to find a way to provide your flock with water a few times a day. In the coldest climates, this may mean taking fresh water out to your flock at least two or three times daily. Other methods include wrapping heat tape around a waterer, or using chicken-size freeze-resistant solar water troughs or heated dog bowls, and so on. If you choose to use electricity in or around the coop, I cannot stress enough that precautions need to be taken to avoid a fire hazard.

One note I need to add on the water thing is that if the temperatures will be in the negative digits, be sure your birds can't step or fall into the water. Water can flash-freeze on a bird's extremities

and cause instant frostbite in these temperatures. You can help avoid this kind of situation by placing rocks in the bottom of the water dish. This will serve two purposes: it will prevent birds from getting into the water, and the rocks will also help maintain heat in a heated bowl.

What about young, ill or frail birds? Obviously the very young, very old, and the infirm flock members will be at the highest risk of succumbing to the cold.

Do not rely on a heat lamp in the barn to keep sensitive birds or chicks warm in sub-zero temperatures.

First, heat lamps are the No. 1 cause of coop fires. It is risky to have a heat lamp in areas filled with dust and flammable bedding materials. Secondly, with temperatures going well below zero, a heat lamp will not be able to create an ambient temperature high enough to keep young chicks or frail birds warm enough anyway. Chicks especially need to be relocated to a room that has its own heat source or that is capable of maintaining a high enough ambient temperature to prevent hypothermia. Chicks under a broody hen should be fine as long as they can't become separated from mom, say by falling out of a raised nest box.

And that's pretty much it. As a chicken keeper, do what you can to protect your birds from frostbite, drafts, dehydration, and fire, and from there, just understand that they are well equipped to manage in cold temperatures. They've been around for thousands of years, and in that time it has been necessary for them to acclimate to all kinds of weather extremes.

Lastly, understand chickens that are prone to heart failure are more likely to die during extreme cold snaps. If you take the above precautions and still lose a bird on an extremely cold night, it's not your fault. It was just a matter of time for that particular bird.

Winter Preparations for Chicken Keepers

By Melissa Caughey

Living in the northeast, we have just become accustomed to snow — sometimes lots of it — during winter. It is always important for us to keep an eye on the weather, as we can quickly go from a



morning filled with abundant sunshine into an afternoon with complete white-out conditions. One of the most important things we do when we know a storm is coming is to prepare the chickens and their housing to make weathering the storm easier. Here are the steps we take as we prepare for snow.

Clean the chicken coop. We clean out the coop and nesting boxes, and we replace everything with a fresh — and thicker — layer of bedding.

Add a supply of fresh water and food to the coop. You can never tell if the chickens will need to stay inside the coop longer than usual due to unforeseen circumstances.

Keep extra water on hand for your flock. Estimate how much water your flock consumes in one week, and store that amount of water inside so it doesn't freeze. You may need to rely on it in case your water service is interrupted.

Visit the feed store. Stock up on enough extra feed, grit, and oyster shells to last at least a week. Also, stock up on extra pine shavings to add to the muddy run and refresh the coop as needed.

Take inventory of your chicken first-aid kit. Make sure your kit contains everything you'll need in case of an emergency. If you're low on supplies, restock as necessary.

Add a layer of plastic sheeting around the chicken run. This cuts down on drafts, keeps snow out of the run, and saves you from having to

shovel out the run. It also allows the chickens more space for roaming, even though a storm is happening outside, and it will help prevent boredom if they are locked in the coop otherwise. In addition, it helps to keep your birds dry, helps prevent the run from getting soaked (which can lead to illness like coccidiosis), and it keeps the flock's favorite dust bathing spots dry.

Reinforce any predator proofing and locks. Check the coop and fix anything that could allow predators to reach your birds, including loose locks.

Come up with a backup plan for heating the coop, if applicable. We don't heat our coop, but if you do, you will need a backup plan in the event of an extended power outage. Sudden changes in temperature will stress — and can kill — your flock. If you've already started heating your coop this year, you can't stop this year, but you can rethink heating the coop next winter.

Consider locking the flock inside the coop. During the worst of the storm, especially overnight, consider locking your birds in their coop for their own safety.

Keep a shovel nearby, along with snow boots and mittens. Think about the best way to access your chickens after the storm is over. Remember that chickens are snow blind and will not venture out onto an unshoveled snowy area. To coax them out, shovel off some walking space and toss on some scratch or treats. 🐔

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Home on the (Free-) Range

“Where the hens and the rooster
are happy all day ...”

By Lisa V. Blake

To free range or not to free range — for folks with a flock, that is the question. Several years of experience raising free-range flocks on my organic farm, Mama Tierra, in Bowdoin, Maine, has led to some useful, albeit hard-won, insights. I did some homework and spoke to other flock owners before undertaking this adventure, but mostly I followed the “Just Lay It” approach and learned by doing. It’s a tried-and-true New Englander strategy that, for better and sometimes worse, can have a long, mild — yet consistent — learning curve.

Before deciding to liberate your fowl to freely follow their bliss, here are a few things to consider for a successful free-

range endeavor. First, let’s be clear about what constitutes “free-range.” It is a fallacy to qualify free-range eggs as those produced by hens raised outdoors or that have daily access to the outdoors. This definition is so vague that it can include hens that might only access the same “outdoor” yard day in and day out. Without specifying the size of the space, this may also mean that, within a matter of weeks, the hens are ranging only in grazed-down dirt and their own waste.

The real definition of free-range means allowing the chickens to be truly free to wander where their little hen hearts desire. Let the hens go, and watch where they head. With eyes on greener pastures, my hen friends would come hopping out the door and head far afield for green grasses

and into woodlands to follow their instincts to scratch and forage. However, the first stop was undoubtedly the compost pile to check out what kind of chicken dumpster-diving feast might be theirs for the taking.

First Step

One of the first considerations for a free-range flock is allowing access to tender green pasture for all birds older than 3 or 4 weeks. They need to be contained and protected at this stage, but putting birds on pasture as chicks lowers the cost of their raising by reducing the amount of store-bought feed consumed. It also encourages the birds’ natural tendency to begin grazing. By eating insects and scratching and pecking in the



soil, chickens access protein and many necessary minerals. Time spent on the pasture as pullets yields hardy hens that produce high-quality eggs consistently the following winter when they begin to lay.

At this early stage of the chick's life, it is important to provide adequate shelter, fencing and protection from both predators and the elements. Consider sowing rye in autumn or a thick early spring seeding of oats to have a well-established and supportive pasture ready for chicks hatched in the spring. Move the poultry shelter often to give the flock clean ground and fresh greens. Even a small flock of fledglings can quickly consume every tasty morsel they can get their beaks on.

To give an idea, an acre is an adequate supply of pasture for 200 adult birds or 300 chicks. Scale downwards according to the size of your smaller flock.

Another benefit of contained ranging is that it is a great way to acclimate the birds to their roosting territory. If possible, build the fenced-in pasture in a manner that allows access to the coop and roosts. This way the birds learn at a young age how to recognize their home base, while you save the time and money necessary to create a separate dwelling. I even built the chicks a small version of roosts and put it out in the range yard for them to begin to practice their perch. They took to it right away and gradually began to experiment with the

Above: Chickens in your garden root out pests for a tasty treat. Top: A Golden Laced Wyandotte chicken takes her brood out foraging. Top left: A rooster leads his ladies out in style.

higher roosts in the coop on their own. A fresh supply of water is crucial, and unless your land has a natural source for clean, moving water, this will be on your checklist to maintain flock health.

The food your birds consume is directly responsible for the quality of their eggs or meat. It is, therefore, crucial to start them off right on a true free-range chicken's natural diet. A variety of greens, plants, worms, and insects is enhanced by direct exposure to the sun, dirt, and fresh air. These are the secret ingredients in the delicious eggs laid by hens lucky enough to range. After they've had their fill, they'll

scope out an inviting sunny patch of dry dirt and take a bath to keep their feathers healthy and clean.

Possible Complications

Now, let's turn to a few of the more complicated aspects of letting the flock out to begin to roam on their own. In my experience, even though my 13 acres in rural mid-coast Maine abuts about 2,000 acres of conservation land, the No. 1 predator I had to be aware of was a Labrador Retriever. In five years, I lost only one bird and had two others come under attack. The culprit in each instance: my neighbor's dog.



Despite leash laws at both the state and town level, the off-leash dog not under the owner's vocal command came into my yard and got the birds. This is an important potential predator to put into your mix when considering your flock's safety. How many dogs live nearby and have access to your land? Can you speak to your neighbors and ask for cooperation? You may want to erect a fence if there is a potential dog menace.

Other threats might come from above, so be watchful for passing raptors and wide-open spaces that could allow them to swoop in for takeout chicken. Once the flock matures, they seem able to sense when to take shelter if a predator is circling.

Because the girls love to bathe daily, your flower and vegetable gardens may become tantalizing venues for their dirt lounge. This can prove to be a major problem both for health risks as well as aesthetic disruptions. When an ideal dirt locale is identified by one hen, the others will follow, which can lead to the necessity to fence in the flowers. If you have several beds like we do, this can get a bit pricey.

Fortunately, hens are creatures of the edge, meaning they also love woodlands and easily relocate themselves under evergreens where the dirt tends to be dry and yielding. My flock has a favorite location



Above: One of the benefits of free-range birds is their propensity for eating garden pests.

Top: This hen party is not in search of tea and cakes, but insects and leftovers.

they visit for their daily dust bath before basking in the sun.

For me, there was never a question about my hens finding a home on the range. I knew they'd lead a happier,

healthier life when given the choice to follow their own nature. And for me, it follows that this free-range lifestyle leads to eggs that are delicious, nutritious and "eggs-cellent." 🐔

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Poultry on Pest Patrol

An all-natural, animated insecticide.

By Pam Maynard

Tired of slugs and bugs destroying your garden? Tired of picking ticks off your children and pets? Did you realize that birds on the farm aren't just for decor or dinner? They can also play an important part in keeping all kinds of pests at bay. Chickens, ducks, turkeys, and guinea fowl are not only entertaining and beautiful, they can supply fresh eggs daily, offer effective bug and slug control, and make charming gardening companions to boot. Ridding your yard and garden of pests with these animated insecticides is the ultimate low-cost, chemical-free approach.

Sound the Alarm

Looking a bit like chicken-sized vultures, guinea fowl strut their stuff across lawns, fields, or gardens — anywhere bugs, snakes, and rodents roam. Some suggest that their shrill cackle sounds like chicken claws scratching on a chalkboard. But to gardeners, these bizarre birds are on patrol — pest patrol. Any bird with a call like “buckwheat!” and a more or less naked helmeted head must have some redeeming qualities. These voracious eaters devour Lyme disease-bearing ticks, fleas, Japanese beetles, June bugs, and many other uninvited creatures. And to top it all off, your crop is quite

safe when you put guineas on garden patrol.

Guinea hens and roosters have keen eyesight. Not only do they spot pests from afar, they also announce the approach of intruders with their distinctive call. Unfamiliar sights or sounds will always create a fuss, but the guinea hen is much more noisy than the guinea cock. The male calls out only when there is good reason, and when he calls out a warning, the rest of the guineas chime in, which creates an intimidating alarm.

Guinea Fowl Are Fun to Raise

If you were to raise your own flock of guineas, you'd likely come to adore — rather than detest — these wacky birds. Their caterwauling would soon be music to your ears, since the cacophonous sounds let you rest secure in the knowledge that your faithful, feathered “watchdogs” are hard at work.

“They are rough, vigorous, hardy, basically disease-free birds,” says Jeannette Ferguson, author of the how-to book, *Gardening with Guineas*. “They are the most active ‘gardener’ on the farm. Continuously on the move, they pick up bugs and weed seeds with early every peck they take, and they do it without destroying plants because they do not scratch like chickens.”



Guinea hen



As the chick mimics her actions, the hen is teaching the youngster to forage.

Even the tenacity of a terrier doesn't terrify guineas. They may scuttle out of the way, but as they fly up to a high perch, they mock a barking dog with their "buckwheat" or "you lose" noises.

Every Silver Lining Has a Cloud

Guinea fowl have several drawbacks that may make them unsuitable for some homeowners. They are noisy and may be objectionable to nearby neighbors. Their droppings, which serve as an excellent fertilizer, may be unpleasant if the lawn is used for a playground area. (Guinea droppings do not, however, discourage Border collies from

rolling in the fresh fertilizer to take advantage of the enticing smell. Or other dog breeds for that matter, but Border collies I can attest to personally.)

Guineas Prevent Disease

According to a study published in the *Wilson Bulletin*, guinea fowl reduced the number of adult deer ticks on lawns adjacent to dense foliage at two sites on Long Island. Adult deer ticks have a 50 percent to 100 percent probability of being infected with the Lyme disease spirochete, so the presence of free-ranging guinea fowl may help reduce the probability of contracting Lyme disease from adult deer ticks on lawns and lawn edges. In addition, guinea fowl reduced the presence of other arthropods such as grasshoppers, millipedes, and spiders, suggesting they may help reduce the need for chemical insecticides.

It's All About the Scratch

Chickens also are great for controlling pests, especially in the garden. Not only do they love grasshoppers, they are excellent at defending a homestead from scorpions, termites, mice, flies, and June bugs. Chickens, in turn, provide fertilizer, fresh eggs, meat and entertainment.

Some folks let their chickens follow behind the garden tiller, catching squirming morsels that happen to turn up. Others use the chickens to till the garden with their endless scratching. This is best done when the garden is finished, or the birds should be confined to a portable pen (often called a chicken tractor). Otherwise, they will likely tear up your plants and poke holes



These fowl are on pest patrol.

Guinea Fowl

Although guineas share a U.S.

Department of Agriculture poultry classification with chickens, they range farther, fly higher, and are more active than chickens.

Guinea guano is high in nitrates, making it an excellent free fertilizer.

Guinea fowl have an innate spring in their step that helps them bounce and keep their balance. Harvard scientists spent months chasing helmeted guinea fowl down a 20-foot plywood runway, trying to trip the birds.

Their goal wasn't to torture them, but to understand how ankles, knees, and hips react on uneven ground. This research aids in creating prosthetic limbs and legged robots that can move over rough terrain.

Turkeys

Benjamin Franklin so admired the big bronze bird that he wanted it for our national emblem. Comparing it to the bald eagle, he said: “The turkey is a much more respectable bird, and withal a true original Native of America.”

Ducks

The Muscovy’s original name was “Musco Duck,” because it is known as the “Mosquito Duck” for eating mosquitoes. One of the main reasons they were brought to the United States several hundred years ago was to help keep down the mosquito and bug populations. That they do, and they do it well. There are billions of insects on an acre of land, and Muscovy ducks are worth their weight in gold when it comes to eating mosquitoes and insects. They eat mosquito larvae in the water, and they nip the flying insects right out of the air.



These hens are scratching out a living, ridding your acreage of pesky insects, ticks, and other pests.

in your prized tomatoes. Free-ranging chickens will also help break up horse and cattle manure, consuming fly larvae in the process, and if an unwise mouse decides to make a break across a hen’s path, there’s a good chance its life will be cut short.

Gobble Up the Bugs

For centuries, people have raised turkeys for food and for the sheer joy of it. Turkeys are excellent insect foragers — about the only insects turkeys will not eat are those they cannot catch. The major insect groups enjoyed by the turkey are beetles, true bugs, grasshoppers, and leafhoppers. Young plants and new fruits may need to be protected from turkey pecking.

In spring, turkeys eat tender greens, shoots, tubers, leftover nuts, and early insects. As the weather warms up, they eat more insects, including grasshoppers, beetles, weevils, and larvae. Hens typically lead their young to vegetation-covered open areas rich with protein-providing insects, which make up 75 percent or more of the poults’ diet until they are 4 or 5 months old.

As the poults grow, they consume spiders, ticks, millipedes, centipedes, snails, and slugs. Turkeys eat a variety of foods depending on availability, preference, and nutritional needs. All age classes eat insects when they are available, and nesting hens consume slugs to supplement their calcium requirements.

Multipurpose Homestead Partners

Whether you choose chickens, guineas, turkeys, or ducks for your homestead fowl, be prepared for the adventure of a lifetime. And even if you think you only want eggs, meat, or living lawn ornaments, with a little management and the right attitude, you can put those birds to work and enjoy their entertainment at the same time. 🐔



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New Work for Old Chickens

Using the flock to turn over soil is only one idea from the book, *Plowing With Pigs and Other Creative, Low-Budget Homesteading Solutions*.

By Oscar H. Will III and Karen K. Will

Back in the day, fowl fanciers and farmstead owners all over the country kept chickens because they were beautiful, particularly suited to a specific region's environment, and for the services they could offer and/or the products they could supply.

Did you know that some fancy fowl

were kept to supply the fashion and fishing-fly-tying industries with incredibly beautiful feathers, which were often harvested without ending the bird's life? Others were kept for the eggs or meat they could provide. And all the while, the birds kept their premises free of all manner of pests, including flies,

ticks, grubs, caterpillars, and even mice and snakes in some instances. Plus, chickens are an end-of-the-day entertainment that rivals the best Broadway show or blockbuster movie. You've heard the expression "sit and watch the chickens peck." For the homesteader, there may be nothing quite so

soothing at the end of a fulfilling day of work than to sit, cool beverage in hand, and watch the chickens just do what chickens do.

So, what is it that they do? Well, if the chickens in question happen to be one of the small handful of over-bred industrial breeds, those poor animals will have few social skills and may grow so fast and so out of proportion that they break bones or die of heart attacks just eight weeks after hatching. Watching these chickens do their thing may be more depressing than relaxing or uplifting — especially if they're in a horrific factory-production setting — but that's not their fault. It's the fault of animal science's morally questionable conclusion that animals such as chickens are nothing more than cogs in a money-making machine. As such, laying hens may legally be crowded into small cages where they cannot scratch, cannot interact socially with one another, and cannot lay eggs in the privacy of a nest box or other "secret" place. On top of all of that, most of the top halves of their beaks have been cut off to keep the overcrowded animals from pecking one another.

Thankfully, a sufficient number of folks interested in animal husbandry eschewed the entire industrial poultry production model and have maintained many of the old chicken breeds and lines. Thus it is that some of those sturdy, older breeds are available today. Birds like the Jersey Giant will net you some eggs and grow to sufficient size to produce a fine table fowl. But more importantly, old breeds like the Jersey Giant thrive out-of-doors, and they will entertain you beautifully while performing tasks you'd rather not do and doing the work of agricultural poisons and synthetic chemicals you'd rather not use.

Chickens in the Yard

Whether you live in town or out in the country, keeping a small flock of chickens in the backyard is not only fun, it's rewarding in a number of ways. As omnivores, chickens will gleefully seek out and devour all manner of insect, bug, grub, larva, worm, mouse, etc. They will also mow your lawn — to an extent, anyway. Chickens relish fresh greens, including grasses and forbs. When they are confined in relatively small areas, they can keep the lawn trimmed (though, when left to their own devices, they have a tendency to overgraze their favorite things, like clover and dandelions, and spend less time on the Kentucky bluegrass). If you enclose your birds in a portable pen, you can move it around the yard in a rotation, and your chickens will do a much more uniform mowing job than

arduous task involves hard, soil-scratching raking that pulls up the thatch of dead grass that collects just above the soil surface each year. Alternatively, you might rent an expensive gas-guzzling power dethatcher that will scratch the soil, while bringing all that dead grass to the surface for easier collection with a leaf rake or a power vacuum of some kind. In either case, you are expending all kinds of calories to undo something that mowing redoes every year. In addition, dethatching can make some turf grass crowns more susceptible to various pests. Here's where the chickens come in.

When left to their own devices, hens will scratch the ground looking for worms, grubs, and other likely food sources. When given plenty of space, or moved around in portable (and bottomless) pens, this scratching will dethatch



Chickens left to roam freely will till the soil in your perennial beds, add beauty and entertainment to the landscaping, and enjoy an overall higher quality of life.

when they are completely free ranging. So, moving them around in a pen can either keep the birds from overgrazing their favorite vegetation or it can encourage them to do just that — to help you prepare a new garden patch. As the chickens graze, they will fertilize the lawn with some of the finest organic material out there, but they'll do oh-so-much more.

If you are a lawn purist, you might dethatch your yard every spring. This

and aerate the lawn while breaking the thatch into smaller, more easily decomposed pieces. The end result is that the chicken dethatchers will render the thatch gone and promote its decomposition in place. You don't have to collect the debris and send it to the landfill or put it in your compost bin. Plus, you can employ chickens year-round to keep the thatch under control. At the same time, they'll keep the lawn fertilized and help control grubs, bugs, and

ticks. Chickens do all this and more for the price of a little bit of feed.

Even if you keep sufficient chickens to handle most of the mowing, you might still choose to mow the front yard more formally. Many people who mow with machines collect their grass clippings in black plastic trash bags, which are then dutifully sent to the landfill every week throughout the summer. It's true that some folks add the clippings onto their compost pile, but those piles often turn into stinking anaerobic messes because clippings have a relatively high protein content. But there is a completely different way to dispose of the clippings. You can take advantage of the fact that chickens like their greens, and simply



Allowing your hens to have free run of your garden — with supervision, of course — can help build the soil, keep pests at bay, and clean up any harvest leftovers.

feed the chickens the clippings. (You'll only want to use chickens to mow if you refrain from applying synthetic fertilizers, herbicides, or pesticides to your lawn. Although some folks say that there's no harm in feeding greens fertilized with synthetic fertilizer, we say, don't do it.)

Feeding grass clippings works best

with chickens that can be confined — even temporarily — to a spacious pen that has one side or corner devoted to the compost pile. (If you live in town where you aren't allowed to have a compost pile, call it a “chicken feed pile.”) As you collect your grass clippings, simply dump them into the pen. You can alternate dumping sites if the chickens aren't eating, scratching up, and aiding decomposition of the clippings quickly enough. Spread them out more thinly if there's even a hint of anaerobic stink going on deeper in the pile.

You can also feed your flock of clucking composters vegetable and fruit waste from the kitchen and garden. The key here is not to overload the chickens. They won't mind, but your neighbors might not like the smell, and the code enforcement officer will likely conclude that those chickens of yours stink, when it's actually the vegetable matter. Either way, at the end of the day — month, more likely — you will wind up with a ton of composted clippings mixed with chicken manure and other good stuff that you can spread on your lawn in lieu of store-bought weed-and-feed that really does nothing but make more work for you. And don't forget, even if you

do plan to eat eggs or meat from your chickens, allowing them to help you out in the yard will go a long way toward obliterating their feed bill.

Chickens in the Pasture

Much to-do is made about free-range chickens these days. Most people imagine chickens roaming peacefully on lush pasture. But the term “free-range” can mean anything from no cages (but crowded indoor conditions), to free access to a concrete yard, to being raised completely outdoors with little more than a mobile shelter to keep them warm and dry during inclement weather. Especially in the case where the birds

are “free” to range inside a chicken production barn, the label is just a marketing scam.

While the completely free-range model is attractive, it is often not practical. The birds might not agree that a barbed wire fence or hedgerow is their boundary, and they are often highly prone to predation. A more practical and humane choice is a free-range model that incorporates some kind of mobile enclosure, complete with predator-proof shelter. You might be wondering: Why raise chickens on the pasture at all, except to lower your feed bill in the production of eggs or meat?

When you run cattle through a pasture in a controlled manner, they don't eat everything, and they don't necessarily eat it down evenly. And, while the action of their hooves can help decompose thatch, their manure patties can become fly-breeding weed patches if left to rot on their own. Those weeds and the patties represent a concentration of fertilizer that would be better utilized if it were spread more evenly over the pasture. We already know that chickens like to scratch the ground — that's great for the pasture in general. And the chickens will also eat some of the

plant material left behind by the grazing cattle. But, even more useful is the way they obliterate manure patties in search of seeds, germinating plants, grubs, fly larvae, and flies. And they distribute all that material in the form of the fertilizer they drop throughout the pasture. No doubt about it, a pasture that welcomes chickens for a fixed interval after the cattle (and/or sheep, etc.) is healthier, more diverse, and freer of flies, grasshoppers, ticks, and other invertebrate pests.

Managing chickens on pasture generally involves movement of a portable laying or broiler house to fresh pasture every day or two. If the birds are tightly

bonded with their structure, they may only roam a hundred yards away from it. If you have light predator pressure, managing this way can work quite well. If you have more predator difficulty and want to limit the size of the chickens' territory, you will want to enclose the birds in large "chicken tractor" pens that have an integral shelter of some sort (and include nest boxes, if you're working with a laying flock). Typically, these pens are moved once or twice per day; larger operators employ a flock of them on pasture. A second alternative is to surround your mobile range shelter with sufficient portable electric net fencing to give the birds the range space they need while keeping ground predators out. This method will not deter any but the most timid of hawks; however, if you can house a chicken-friendly dog along with your birds, you will go a long way toward solving a hawk problem while using the relatively large area, open-top electric netting system.

Chickens in the Garden

As you might already imagine, due to their natural scratching and bug-eating tendencies, chickens have a place in the garden. That's true, but, because chick-



While they have a tendency to overgraze on favorite greens, chickens can be put to use mowing the lawn, plus they'll devour any number of unwanted insects.

a good time to spread hay or straw for the chickens to work into small pieces. And since you must feed your birds through the winter, you'll save yourself some collecting and spreading of manure if you simply let the birds do it for you right there in the garden.

In spring, the chickens will gleefully consume, trample, and generally dispatch any green manures you may

orderly, by all means make your tractor the way desire or necessity dictates, and just have fun with it.

Let's say you have one tractor sized for paths and one sized for beds. You could move the path-maintaining tractor around the garden (or into the yard) as required. And you could move the bed-sized tractor from bed to bed, allowing the chickens to prepare the ground for

ens also love to eat tender young vegetation and fruits like tomatoes, and grains like wheat, their services as gardeners need to be employed a bit more carefully in some cases. Don't let this need for more careful management turn you off, chickens can do much of the legwork involved in building humus-rich soils, keeping pests at bay, composting garden mulch and waste, and post-harvest gleaning.

Consider a typical four-season garden scenario. During winter, you can use your garden as a temporary chicken run, if you have a good enclosure or easily handled portable enclosure that can be moved around in the snow. Winter is

have planted in the fall or late winter. They'll continue to work hay and straw down into a friable mulch, and they'll stir the soil surface to aid with seedbed preparations. When you're ready to plant, it's time to pen up the hens a bit more tightly, though. Many folks build chicken tractors that are sized to travel down the garden paths — so their garden hens can keep the paths weed free and well mulched. Others build tractors the same size as the garden beds (raised or otherwise) and move them onto the beds as crops are harvested. Choosing these options will make your chicken-tractor rotations more rational and orderly — but if you're not into

planting by converting hay, straw, grass clippings, etc., into mulch that will later get incorporated into the soil. Later in the season, you can move the bed-sized tractor to harvested beds to allow the birds to glean, clean up any remaining bugs, and help ready the ground for the next crop or cover crop. You can use the chicken tractor to mow down mature cover crops, and so on. The downside with chicken tractors in the garden is that you can't use them to get much help cultivating young crops or controlling bugs in maturing crops.

Some folks use a combination of chicken tractor(s) and chicken moat in their gardens. In theory, the moat



Surrounding buckwheat with electric net fencing keeps Freedom Ranger broilers safely contained, while they convert the cover crop into valuable meat and fertilizer.

model works like this: Create a more-or-less permanent chicken tractor (covered run) all the way around the garden, and populate it. The moat should be at least 3 feet wide, and you can use it as a location for the birds to process compostables as well.

In theory, the moat will keep most crawling pests from migrating to the garden because the birds will pick them off as they make their way through the moat. It's just another way to get useful work from the birds.

Chickens can also be used quite successfully to keep certain crops relatively weed- and bug-free if you let them roam freely in the crop.

In these scenarios, you'd typically fence off the crop in question from those that the chickens will damage. For example, you can turn your hens into corn, okra, asparagus, sunflowers, potatoes, and other crops once the plants have gained sufficient height that the

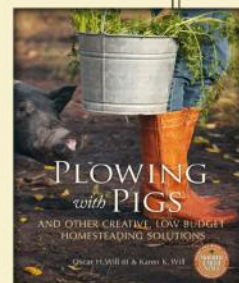
chickens can't damage the fruit or tender new growth.

NOTE: Potatoes don't generally fruit above ground, and the birds aren't fond of the leaves, but some food-safety experts caution that digging root crops in close proximity to fresh manure can increase the likelihood of bacterial contamination, some forms of which have been quite deadly in recent years. We can thank industrial agriculture's overuse of antibiotics in feed, the overfeeding of grains to grazing animals, and other practices that all pretty much point to poor sanitation — a lack of animal husbandry, actually — for those superbugs. Frankly, the likelihood of contracting any serious disease from letting your chickens run in the garden is pretty slim.

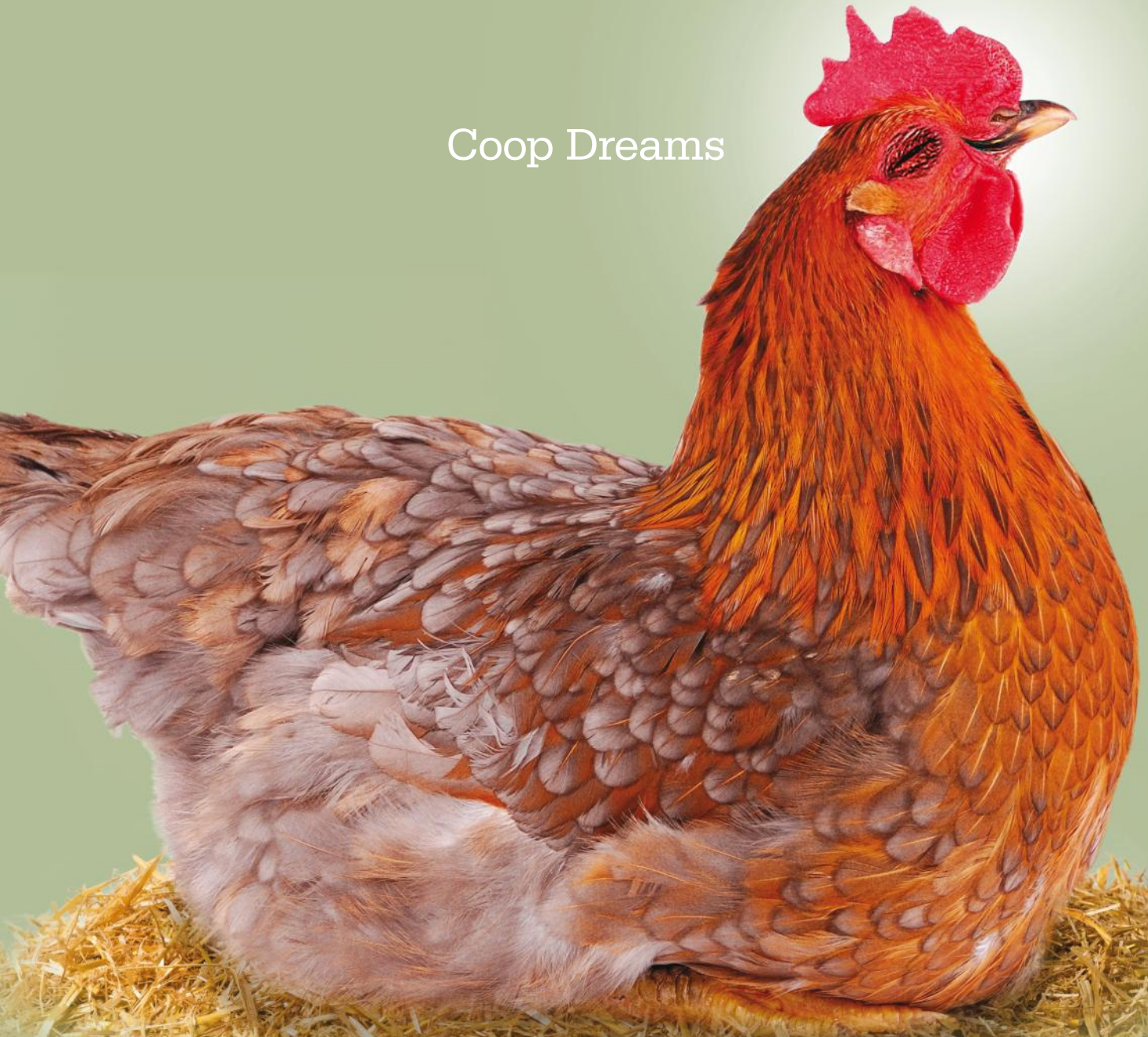
The bacterial contamination caveat notwithstanding, you can turn your chickens into your corn patch with little worry of making anyone sick.

The birds will enjoy the shade and will feast on the young weeds and myriad insects and caterpillars they're likely to encounter. Some of the more aggressive hens will figure out how to fly-walk up the stalks as the ears fill. If you observe this behavior, simply move the chickens elsewhere. At that point, your corn crop is pretty much assured — so long as you have a raccoon-control method in place and aren't inundated with grain-robbing migratory birds. 🐷

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Exploring BACKYARD CHICKEN BEHAVIOR



The pecking order is a natural and healthy form of communication that helps the flock establish and maintain dominance.

By Pam Freeman

Learn *all about raising backyard chickens from small beginnings with chicks and eggs to identifying problems within backyard flocks and how to fix them in Pam Freeman's Backyard Chickens: Beyond the Basics (Voyageur Press, 2017). Freeman's practical advice helps to make chicken keeping easier. The following excerpt is from Chapter 2, "Flock Behavior."*

Until I started raising my own backyard flock of chickens, I never thought much about chicken behavior. Yet after I got my birds, I found myself entranced. It started with the chicks in my brooder. They were fascinating! I spent hours watching them scratching, pecking for food, grooming, and even learning to perch. Once they were grown, I loved going outside and interacting with them.

My Barred Plymouth Rocks were the

best foragers. Any time I dug holes for planting or turned over a rock or log, they were there to get the best goodies. My White Leghorns, contrary to their breed profile, were so docile I could hold them in my hand and pump them up and down like I was weight lifting.

Hoppy, our Partridge Cochins, formed a special bond with us. She loved to talk to us and come over for pets. One day our dog, Sophie, got out of our fenced-in yard. We needed to get her back safely so we split up places to find her. I went to the bottom of our driveway to make sure Sophie didn't get out onto the road. My husband stayed in the backyard area calling for her and monitoring the front of the house too. I had been gone a while so I came up the hill to report my lack of progress. There I found my husband calling for Sophie and right next to his feet was Hoppy. Every time

he would call, she'd call out too. (I definitely think Hoppy helped since Sophie returned to the backyard on her own!)

Now, years later and with much more experience, I confess I'm still fascinated by chicken behavior. I've found chickens are definitely smarter than people think. They are capable of learning basic routines and adjusting to meet their needs.

Our New Hampshire named Big Red knows that we have food inside the house. She's well aware of where the door closest to the kitchen is located and will make her way there as much as possible. Once there, she'll call loudly until someone hears her and either shushes her away or lets her pop into the mud room to grab a treat. She learned this because each time she came to the door we gave her a treat. We thought the whole thing was fun, and we unknowingly established a routine.

Red can also figure out where voices are inside the house and knows if she creates a ruckus then we'll come outside and check on her, usually resulting in a treat being given. I first noticed this when my husband was in our bedroom on the phone. Big Red was smart enough to walk around until she heard his voice and then stand below that window and call loudly. After he got off the phone, he went outside to see if she was OK and, sure enough, she got a treat. Smart girl!

Perhaps one of the best things about owning chickens is the countless hours of entertainment and fascination they can hold for the whole family. Let's explore the world of flock behavior!

The Pecking Order

Chickens are flock animals that enjoy social interactions. As with any group, they have a way of organizing so that order is maintained. This is called the pecking order and it influences the daily activities of the flock, from eating and drinking to perching and dust bathing. It has been theorized that the pecking order started with Red Jungle Fowl in Thailand. When food was found, it was important that the flock stayed quiet and orderly so they did not attract the attention of predators.

The highest-ranking birds eat first and then lower-ranking birds eat. That way the strongest birds remain fit and able to reproduce, passing on their strong genes.

In a flock of chickens, the dominant bird is at the top and no other bird is allowed to peck that bird. However, the chicken at the top can peck all the others to tell them what to do. The pecking order descends like this from highest to lowest in rank, with the lowest bird not being able to peck any of the other birds while all the other birds are able to peck him or her.

The pecking order in a flock is established early. In fact,



A chicken's rank within the flock can change at any time depending on dominance displays. Opposite: A flock's pecking order will be maintained even by its smallest members.

studies have shown that chicks can start to show competitive behavior at 3 days old. After they are 16 days old, they begin to establish the order of dominance. With an all-hen group, the pecking order will be set by the time the chickens are 10 weeks old. It can be even earlier for the small groups of birds — possibly as early as 8 weeks.

NOTE: *Pecking is not always bad or violent. It is a normal and important form of communication. In fact, pecking is usually gentle and not even all that noticeable by humans. You'll find feathers are rarely disturbed as chickens "check out" each other and establish a hierarchy for functioning as a group.*

Besides pecking, there are other ways chickens work out their order and show dominance. One chicken might challenge another by puffing up her chest, standing tall, and flapping her wings. The challenged bird can then either choose to show its dominance or back down.

Both roosters and hens will also show their dominance by flaring their hackle feathers, which are located on their necks. Sometimes a bird will drop a wing and dance around in a circle to show the others who's dominant. This can all look funny to watch and a little violent, but humans should not interfere unless a bird is hurt.

Usually this process looks worse than it actually is, and none of your birds will be injured.

The pecking order is ever changing, with lower-ranked birds challenging higher-ranked birds for a chance to move up. Within the order, it's not unusual to see friendships form. You'll often see hens broken off into friend groups that hang out together throughout the day. If a friend is lost or gets hurt and has to be removed from the flock to heal, her



Chickens preen daily to ensure their feathers remain healthy; preening helps chickens waterproof their feathers (left and above).



other friends can sometimes be seen standing in the spot they last saw her and looking for her. Once the bird returns, the friendship resumes.

Preening, Dust Bathing, and Sun Bathing

Preening is something that chickens do at least twice a day, and this behavior is easily spotted. You'll see a chicken standing still and rubbing her head along her tail and then along her feathers. What she's doing is gathering some preening oil from her uropygial gland, which is often called the

preen gland, and distributing that oil through her feathers. In ducks, this oil keeps them waterproof as they swim. In chickens, this oil makes the feathers more water resistant and keeps them healthy, which means they last longer and are less likely to break.

Dust bathing is an essential chicken behavior and an opportune time to observe a flock's pecking order in action. If you've never seen a dust bath before, it can initially look like your chickens are dying. They are usually laying spread out in the dirt at ominous angles and sometimes they even look unconscious. On further inspection, the birds aren't dead or in the throes of dying. They are just so deep in enjoyment and relaxation that they are hard-pressed to respond.

NOTE: *It's important to understand exactly why chickens dust bathe. By bathing, chickens are able to remove mites and other parasites as well as old skin and excess oil. This keeps them clean and healthy.*

No matter where your dust bath is located, you'll notice that the dominant birds will bathe first. They will locate the best spot for the bath. Then they'll start to dig and move their bodies to clear out an impression big enough for them to fit. The impression will get bigger over time as the birds work farther into the hole, scraping and throwing dirt over their bodies and working it into their feathers.



Dust bathing helps maintain the pecking order as highest ranking hens take turns in the best spots first, followed by lower ranked hens (above). Right: Sunbathing helps chickens rid themselves of mites and other parasites.

If others in the flock notice the dust bath, you can frequently see them marching around and around trying to join the bathers. If the bathers are the dominant birds, you'll find they won't leave the bath until they are good and ready.

Conversely, if the bathers are less dominant birds, they'll have to leave since others outrank them. Sometimes less dominant birds will try to fit themselves into the hole. This gets easier as the hole gets bigger and there's more room. But until that point, the dominant birds will not move over and make room.

Sun bathing sometimes takes place while chickens are dust bathing, but other times you can walk into a chicken yard and see your chickens seemingly unconscious with their wings spread out as they lie in the hot sun. It can be an enormously hot day and when you see this behavior you start to wonder why? Why would chickens knowingly expose themselves to such hot temperatures?

Sun-bathing chickens are actually purposefully exposing certain parts of their skin to sunlight.



Their sun-bathing postures give away what parts they are trying to expose.

- They may stand with their back to the sun and puff their head and back feathers.
- They may lie down and spread their wing feathers and tail feathers.
- They may lie down and turn over to expose areas underneath their wings and their breast.

Chickens use unique calls to communicate with each other and with their caretakers.



Chickens are not the only birds that exhibit this behavior. You can see wild birds sun bathing too. In cold weather, sun bathing makes total sense. The birds are warming themselves without using a lot of valuable energy. If birds are wet, sun bathing is the perfect way to dry off.

Sun bathing is also a valuable health tool. External parasites such as lice and mites can wreak havoc on a chicken's health, and these pests are not fond of overly hot and exposed conditions. So by purposefully sun bathing, chickens can encourage parasites to move to cooler locations that are easier for the chickens to reach and then pick off the parasites.

Sun bathing also helps to warm a chicken's preening oil, making it easier to spread and distribute evenly through their feathers. This is why you often see chickens preening immediately following sun bathing. And the ultraviolet rays from the sun convert the chemical compounds in their preening oil into vitamin D, which helps to maintain a chicken's good health.

Vocalizations

People who don't have chickens tend to think the only sound they make is that of a rooster crowing. Nothing could be further from the truth! Chickens have a language all their own, which they use quite often. What's more, their vocalizations start early.

While still in the egg, a mother hen will talk with her chicks through clucking sounds. She will offer comfort and encouragement. Once they're outside the egg, the chicks can recognize their mother hen and each other and start building their relationships.

Chicks will communicate among themselves and with their moms or their human caretakers. A brooder full of chicks is not a quiet place. If the chicks are content, they will happily scratch and peck and chirp to each other as they go about their business. If they get lost from their group, they will chirp loudly and with obvious distress. If they get cold, that chirping is just as loud and just as upset.

Mother hens talk with their babies quite a bit. When the chicks are in their eggs, mother hens will purr to their chicks. This helps the chicks recognize her when they hatch and tells them what's happening. A mother hen will cluck to her chicks when she's pointing out something good to eat. If there's something that's not good to eat, she'll vocally point that out too. Broody hens and mother hens also growl when their nests or chicks are disturbed.

Flock members will do the same thing as chicks: They will chirp back and forth to each other as they're grazing and going about their days. A hen will also sing an egg song after she finishes laying an egg. The level of singing can vary from breed to breed, but it will often provoke others to sing too. Some days an

egg song can turn into an egg cacophony! No one is sure why hens sing an egg song. Some speculate they're proud of their laying accomplishment, others say they want the rest of the flock to know where they are, and some say it's a way of distracting predators from the nest as the hen is moving away from an egg she just laid.

If a rooster is in a flock, he will sound different alarm calls for different types of danger. The same is true of the lead hen of a flock with no rooster. Often the alarm call for an aerial predator is much more high and shrill than the alarm call for a predator on the ground.

Chickens also make growling types of sounds when they're frustrated, such as if they need more food or they just can't wait for a hen to leave the nest box they want. They will also make high-pitched sounds of encouragement, like when you bring treats to them and don't give them out soon enough.

Listening to your flock's different vocalizations is fun, and it's a great way to get to know them and bond with them. Soon you'll understand some of their language and be able to "talk" right along with them.

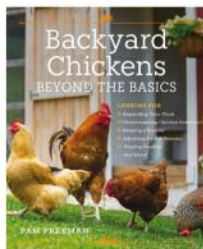
Roosting

Roosting is another chicken activity that shows the pecking order in action. Roosting is an essential survival tool for birds that are ultimately prey animals. After all, the higher you can get and the more you're buffered on both sides, the better your chances for surviving the night.

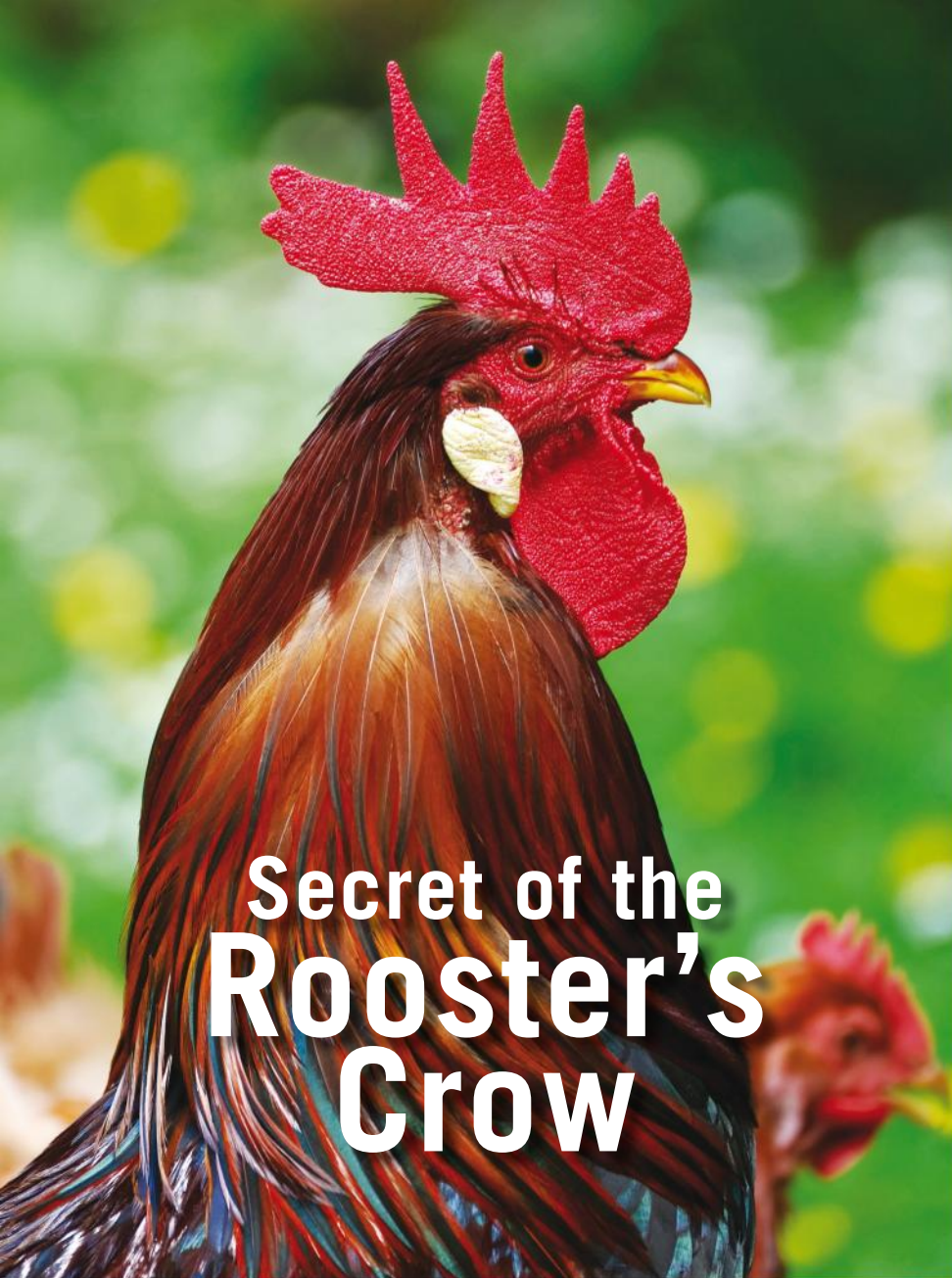
Many chicken coops have roosting bars at multiple heights while others have just one long bar that runs the length of the coop. Either way, there are preferred spots, and friends like to be next to each other. Usually around 30 minutes or so before the sun sets you'll see your chickens filing into the coop for the night. This is when the action takes place. The dominant bird takes the best place on the roosting bar, and she will defend her spot. As others file in, she will peck and squawk to move birds around to her satisfaction. If by chance a lesser bird has gone to the coop a little earlier to land the most coveted spot, that bird will be unceremoniously moved. 🐔

Reprinted with permission from Backyard Chickens: Beyond the Basics by Pam Freeman and published by Voyageur Press, 2017. Available on the GRIT website, www.grit.com/store.

Pam Freeman reveals how entertaining raising backyard chickens can be while exploring the realities of keeping a backyard flock for fresh eggs in *Backyard Chickens: Beyond the Basics*.



The higher ranked hens have their choice of roosting spots, the best of which are on the top branches.



Secret of the Rooster's Crow

This rural resident's morning ritual has little to do with time.

By Jennifer Nemeč

He is an icon of the morning. In most every rural scene he crows to greet the dawn. He crosses cultural and geographical boundaries as the harbinger of daylight. He says “Cock-a-doodle-do” in English, “Kikeriki” in German, “Kuklooku” in Urdu, and “Ko-ke-kok-o” in Japanese. Biblical scenes center around his call, and he takes top billing in the folklore of countless cultures.

In Southeast Asia, the Hmong tell this

tale: A long time ago, when the world was new, the sky held nine suns. The land was hot, the river dried up, and crops began to die. The people decided to ask their best archer to shoot the suns out of the sky. The next day, one by one, he shot the suns. Frightened, the last remaining sun hid behind a mountain where the archer could not reach her. Soon the people realized their mistake. The world grew cold, and the crops did not grow. The people

spoke gently to the hiding sun to coax her back. They also asked animals and songbirds to try, but none could convince her to return. Finally, someone suggested the rooster, because he was fearless and would not give up. Agreeing to help, the rooster crowed three times, and the sun, believing she was safe, rose from behind the mountain. To show gratitude to the rooster, the sun placed a bit of the morning sky on top of his head.

But why is it that the rooster gets so excited about dawn's rosy fingers? Does he take his job as the farm's alarm clock too seriously? Does he just have something important to say?

Turns out the answer is simpler than you might think. First, roosters crow all the time; it's more about genetics. Some roosters crow all the time, others only a few times a day.

Roosters crow because they hear other roosters crowing, to show that a certain place in the barnyard is their turf, to try and assert their authority over another rooster, or even to gloat when a hen cackles after laying an egg. They also crow to alert the hens of predators or to gather them into the coop at night.

A study by Takashi Yoshimura of Nagoya University indicates that roosters do appear to have an internal clock, and they seem to know when dawn is approaching. According to Jen Viegas at Seeker.com, “To solve the mystery, Yoshimura and colleagues kept roosters under round-the-clock dim light. This didn't deter the roosters. No matter what, they kept crowing each morning just before dawn.”

As a diurnal animal (one that is active during the day), the rooster starts his daily doings when the sun comes up. If you think about early morning, it's almost always associated with bird song. Most birds seem to spend time shouting their messages to the world in the morning, and chickens are no different.



David Feldman addresses this question in *When Do Fish Sleep?* He quotes Janet Hinshaw of the Wilson Ornithological Society who says, “Most of the crowing takes place in (early) morning, as does most singing, because that is when the birds are most active, and most of the territorial advertising takes place then. Many of the other vocalizations heard throughout the day are for other types of communication, including flocking calls, which serve to keep members of a flock together and in touch if they are out of sight from one another.”

The reason that we associate a rooster’s crow with the dawn is most likely because that’s when it’s most noticeable to our sleepy selves. When the relative quiet of night is disturbed by the local rooster, we sit up, take notice, and maybe grumble a little on the way to the barn. 🐔

LEFT TO RIGHT: ©STOCK (2)/DIRK FREIER, MAGDALENA JANOWSKI

Quieting the Rooster

When “Secret of the Rooster’s Crow” first appeared in GRIT, it stirred up a question, which then prompted a handful of responses.

ROOSTER DOESN’T QUIT

I live in a suburb of Austin, Texas. My neighbor has a rooster in a cage that is kept on their back patio. This thing crows every 30 minutes, on the hour and half hour, all day, every day. The timing never changes, as I can set my clocks by his crow. I have NEVER heard of this. Why does he crow every 30 minutes — even after dark?

Debi Hicks
Pflugerville, Texas

It seems roosters crow any time of the day or night, and we only associate it with a morning alarm clock. But why Debi’s neighboring rooster crows every half hour, well, that’s a mystery to us. — Editors

Thanks to Marilyn and Loretta for their thoughtful comments.

LIGHT AND DARK

Roosters will crow following a loud noise any time of day. I think they think it’s competition.

As to crowing after dark, is it really dark in the coop? A security light in the neighboring area, or a bright light from a window that can be seen from the coop, will result in a rooster crowing at night.

Marilyn Antill
Centerville, Pennsylvania

LIKE CLOCKWORK

Regarding the reader whose neighbor kept a caged rooster that crowed every 30 minutes: We’ve found that our roosters crow in response to noises and events that they perceive as threatening, as well as crowing when they want me to let them out of the coop in the morning to free-range.

When our coffee grinder starts up at 5:30 in the morning, they crow in response. When our alarm clock goes off (at whatever time) they crow in response. When they hear a car coming up our dirt road — you guessed it — they crow. If the rooster is crowing exactly every 30 minutes, my guess would be that the neighbor has a clock that chimes on the half-hour.

Loretta Liefveld
Three Rivers, California



Chugalug Chickens

Using these DIY plans for an eight-station hydrator, you'll never change another chicken waterer again — at least not daily.

By R.D. Copeland

I'm of the opinion that chickens do better in large numbers; dozens of hens hanging out together, just like their eggs. Gangs, armies, fantastic flocks of fowl, hustling about the barnyard, grassy pastures, and all along the fence lines. Community chickens. Chickenopolis. More chickens, more eggs. More roasted chicken. More chicken and dumplings. More chicken stock, chicken enchiladas, chicken tetrazzini. More of everything.

You get the picture: Plenty of farm-raised chicken for you and the family. The correct number and balance here at my farm seems to be around 25 hens and a couple of roosters. But I'm always in the market for a few more chickens. Got any for sale?

Once you find yourself surrounded by 20 or 30 chickens,

you'll need to help them out with a source of clean water, supplemental food, and a place to lay their eggs and stay safe at night. Even though I have a few cocky birds that go off the chicken grid here once in a while — a rooster and two hens sometimes camp out at night when their extreme free-ranging nature carries them deep into the woods — I still like to provide a friendly habitat for the rest of the gang. They could possibly be outnumbered by predators out here where I'm located. Coyotes love chicken enchiladas. Dang coyotes.

You can go about your day refilling water buckets (as they get tipped over) and water troughs (as they are fouled regularly) to make sure your feathered friends have plenty of fresh drinking water, or you can set up a constant flow of H₂O for the thirsty little cluckers. Where might you get such a



Suggested Parts List

- 12 feet of 3/4-inch PVC pipe (two 6-foot sections will work and fit into your Jeep Liberty or pickup truck bed.)
- 10 - 3/4-inch PVC caps
- 9 - 3/4-inch PVC Ts
- 1 - 3/4-inch collar
- 1 - 3/4-inch PVC compression valve
- 1 - 3/4-inch PVC drain valve
- 1 - 3/4-inch PVC to standard pipe fitting (check your water tank for the threaded size PVC fitting you'll need.)
- PVC glue and cleaner
- 12 water nipples for poultry (local feed stores, Tractor Supply, FarmTek, etc.)
- Rain gutters (to fit your chicken coop)
- Gutter downspouts (2 or 3 according to coop roof style – shed or gable)
- Gutter pipes (lengths to fit, from coop to top filler hole of barrel)
- Screen (to cover the top filler hole of water tank)
- Roofing screws
- Pipe thread tape
- Water tank (size to fit top of tank under roof of coop, but 10 inches higher than floor of coop if possible; bottom drain hole must be sized to fit 3/4-inch PVC from standard pipe threads)
- Water tank stand (for positioning tank at side of elevated coop or alongside barn)

Tools

- Drill/screw gun (I like cordless. If you find one that outlasts a child's attention span, please let me know.)
- Hacksaw or PVC cutter
- Open-end adjustable wrench (aka crescent wrench, small size)
- 3/8-inch drill bit (for drilling holes in PVC caps; match bit size to water nipple threads, some are different)
- 3/4-inch drill bit (speed, metal; depends on type of wall you are passing through)

life-giving gadget? Well, Tractor Supply Co., Atwoods, your local feed store, even online at sites like www.farmtek.com — they all sell watering systems and water bottles for use with almost every species of livestock, chickens included.

However, the price tag might ruffle a few feathers if your chickens are on a dirt farmer's budget like mine.

If my chickens and I owned a chicken supply website, we'd have a much fancier watering system, and possibly fancier chickens, but don't tell these hens — they're already looking for an excuse to take a day off from egg laying.

So, in the absence of a dot-com windfall, I made my own chicken watering system using spare PVC, a dozen water nipples, roofing tin and screws, a 100-gallon tank, and few spare parts. And it works just fine, at a fraction of the price. More money for more chickens. See where I'm headed?

I'm sure your chickens already love you, but with a constant flow of fresh water, they're going to really thrive. Here's the DIY instructions for a setup similar to mine, with the capability to supply eight chickens fresh water all at once.

Assembly

Understand that this watering system could have thousands of different shapes and sizes (and the illustration on the previous page is yet another example of the possibilities), applications, and coops or barns to match up with, not to mention the possibility of using all secondhand parts, pilfered from dumpsters, trash heaps, and that pile of junk out back of the hay barn.

Whatever you already have, or can get for free, use it. If you find a 12-foot stick of 1-inch PVC, use it and buy PVC parts in 1-inch size instead of $\frac{3}{4}$ -inch.

If you have a 20-gallon water tank, use it; just alter your rain catchment and the height of your water tank stand to



match the height of your coop's eave. The water tank needs to be short enough to fit under your coop (barn, shed, house, garage, etc.) roof eave, but also elevated above ground at least 18 inches. This makes room for the overhead water feeder pipes out into the chicken yard, barn, or coop.

For those starting from scratch, begin by sizing up your coop, barn, or box — as long as there's a roof, you can catch rainwater in your water tank from that roof.

My coop is 4-feet-by-8-feet-by-4-feet and elevated 3 feet off the ground. A shed roof runs toward the 8-foot back side and into a rain gutter, which is attached to the coop. Use the proper brackets and/or roofing screws to attach the gutters to your coop (I screwed the gutters right to the coop on mine).

Attach a downspout to the gutter nearest the water tank. Measure the length between the downspout and the tank filler hole. Try to keep the tank close to the coop so you won't need a long length of pipe to connect the two. Attach one end of the connector pipe to the downspout, then place the other end over the top hole in your tank.

Attach a downspout to the tank end of the pipe. Now, rainwater will run off the coop roof, into the gutter, through the pipe and into the tank. Also, it's best to attach a screen cover over the top tank hole, or fill in the opening around the rainwater downspout with something so nothing sneaks into the tank, clogging the pipes and fouling your chicken's water.

Now that you have a tank full of fresh rainwater and a flock of thirsty birds, a delivery system with easy access

for the chickens is needed. PVC pipe and fittings are the cheapest parts you can buy and there are usually discounted bits and pieces available from most home improvement stores, especially your local hardware dealer. Shop with Mom and Pop and you'll likely be made aware of many steals and deals.

Chickens could be drinking gallons of water at night, but I doubt it. Every time I peek in on them they look at me like my ex-wife did when I woke her up an hour before the alarm clock went off.

Chickens do like to hang out inside their coop on cold or rainy days, so I added a pipe from the water tank to inside their coop with two drinking nipples they can access any time they need a drink.

Just to be safe, I drilled a few small holes in the floor of the coop beneath the nipples in case the inside pipe or nipples get broken, so spilled water can drain out of the coop. If your birds are in a big barn, they'll be safe from any spillage.

Extending in the opposite direction from the coop off a PVC T, the pipe runs for 8 feet across the coop fenced area, 1 foot above ground. The nipples hang at 1-foot intervals along the length of the PVC pipe. To build the watering stations along the pipe, prepare all your lengths of PVC pipe first, gather up all the Ts, the end caps, and however many nipples you need for your flock. For my version, we're using seven outside stations, and one inside the coop.

Cut eight pieces of pipe to 10-inch lengths. Assemble with watering nipples, and you're in business.

Now that you have infinite watering capacity, you just might need some more chickens for your flock. Maybe get an incubator and start hatching chicks? Yep, gonna need a couple of broody hens too, for natural hatching ... anyway that's another story. But seriously, y'all gotta get with the "Community Chickens" program. 🐔



DIY Broiler Coop on a Shoestring Budget

At about \$50 to build, this movable chicken tractor is durable and about as cheap and simple as they come — and doubles as a cold frame!

By Nathan A. Winters

As the number of people interested in growing their own food continues to grow, raising a small flock of backyard chickens for meat has become more widespread. From large flocks in rural fields to abandoned parking lots that harbor a handful of birds, chicken coops are popping up everywhere.

When I started my own small farm, building a chicken coop for broiler chickens was at the top of the priority list. At first, the task felt a bit overwhelming as I scoured the Internet and print catalogs in search of ingenious concepts. What did I find? A plethora of prefabricated chicken coops in a wide variety of designs, ranging from basic wooden A-frames to fancy miniature log cabins equipped with sliding windows and rain gutters — one or two might have even been air-conditioned.

These coops were fun to admire, but they all had one flaw in common: They were out of my budget.

I needed a design that was portable, protected my flock, allowed my birds to forage, and it had to be built on a shoestring budget.

Blogs and forums were helpful in terms of suggestions and eye candy, but when I shut down the laptop and picked up John Seymour's book, *The Self-Sufficient Life and How to Live It*, I found my practical inspiration. Seymour's do-it-yourself approach to just about everything reminded me that I didn't need any fancy designs or materials. All I needed was a simple bird cage — and that is what I built.

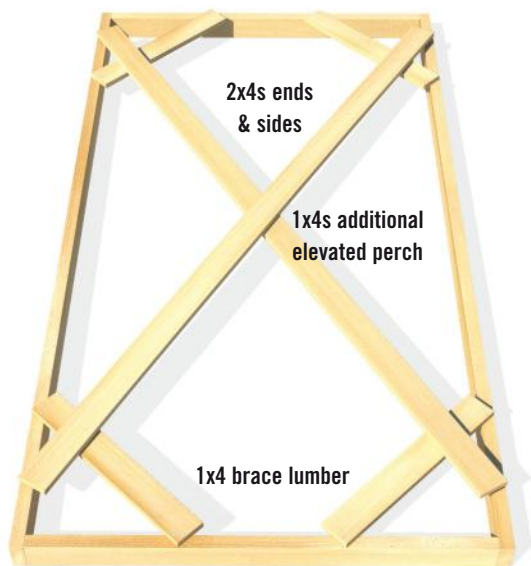
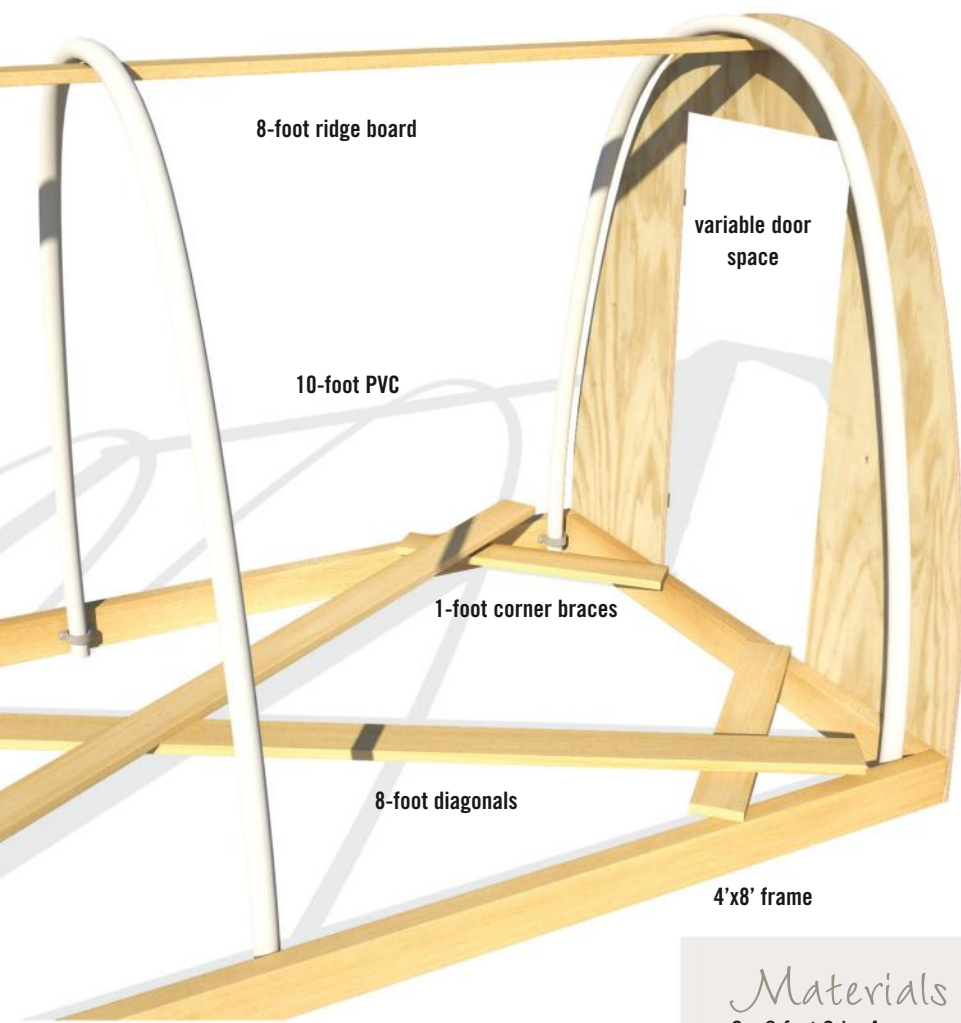
I should mention up front that you won't find my chicken coop in a designer catalog, but if your goal is chicken in the freezer, follow along with these simple steps.

Building the Frame

My goal was to conserve resources and save money by avoiding the use of a gas-powered engine to move my relatively large chicken tractor on a daily basis. I also knew that late spring and early summer would bring dramatic weather to the hills of Vermont by way of wind and rain. All it would take was one good gust of wind to knock over my chicken coop and expose the birds to predators and weather.

I decided to build the frame with three 8-foot 2-by-4s. The lumber was adequately durable and light enough to remain portable by my own human means. To build the frame, I cut one 2-by-4 in half and created a simple rectangle using those two 4-foot pieces and the other two 8-footers.

Kicking around the woodshed, I noticed a few 1-by-4 boards that measured 12 feet in length that I could finally put to good



Materials

- 3 - 8-foot 2-by-4s
- 1 - 4-foot-by-8-foot plywood 3/4-inch thick
- 3 - 3/4-inch 10-foot PVC pipes
- 1 - 25-inch-by-50-foot roll of chicken wire, medium gauge with 1-inch holes
- 1 - 7-foot-by-10-foot tarp
- 3 - 12-foot 1-by-4s
- 8 feet of nylon rope
- 2-inch screws
- 2 small door latches
- 4 small hinges
- 200 zip ties

A portable coop can be as fancy as you want. On a shoestring budget, keep in mind, all you need is a bird cage for protection from the elements and predators.

use. I cut one board to 8 feet (the length of the coop) that would eventually run diagonally across the middle of the frame from corner to corner to offer support and provide a low perch for some of the chickens. But first I took the remaining piece of the 1-by-4 and cut it into four small pieces and used them to hold each of the four corners together. This is an important step that prevented my frame from coming apart as I moved it around the field all season long. Fixing a broken coop out in a field with chickens foraging and frolicking all around your workspace is not ideal.

Next, I screwed that diagonal piece into place, attaching it to the top of the corner braces, and I later cut another 1-by-4 to 8 feet and placed it diagonally at the opposite corners. This added some space for birds to perch as I added broilers. You also can hold off on installing these pieces, which makes it a little easier to work on your coop during assembly.

The next step was working on the back wall and the primary door for access. Because my 1/2-inch plywood was 4 feet in length and the same size as the width of my frame, all I needed to do was take one of my 10-foot PVC pipes and bend it to the shape of my future shell, place it on the plywood, and cut my piece out with a jigsaw.

To establish my door, I found a piece of scrap wood that was a good size for a door and placed it in the middle of my back wall, then traced it. The jigsaw made short work of the door and door opening. I trimmed about 1/8 inch from the door to allow room for my hinges and latch, which I next installed. It is crucial to shave off just enough room to allow the door to swing freely, without leaving too much room for potential predators to squeeze through. Once the wall and door functioned properly, I found some leftover brown and white paint and created a pseudo barn door, giving my structure a little style, yet not deviating from its rustic, gritty mission.

Now I needed to build a protective hoop-style shell. Accomplish this by taking three PVC pipes and bending them across the width of the frame and screwing them to the 2-by-4s of the frame; one at

each end (attached at the corners of the base frame) and one in the middle. The 10-foot pipes worked perfectly.

Once I had three hoops ready to act as my shell, I cut another 1-by-4 to 8 feet and ran it across the top of my structure, screwing it to the top of the door frame and to each PVC pipe.

Next, I built the protective layer using a medium-grade chicken wire with 1-inch holes to avoid problems with weasels — smaller mesh wire may be even better depending on the kinds of predators taking aim at your flock.

I chose chicken wire because it's inexpensive, protects well, and allows tremendous airflow and sunlight into your coop, which creates a recipe for sanitation and health within the flock.

Brand-new chicken wire in a roll can be frustrating to work with since it likes to coil itself back into a roll without warning. After several wrestling matches with my chicken wire, I stapled the wire to the outside of the base 2-by-4s before I unrolled it. Then all I had to do was lay it over the top of my shell and staple it fast to the other side.

Staples are cheap, so don't be shy. After I snipped the wire just below the staples and repeated the process a few times so that the entire shell was covered (including the end opposite the door and over the hoop part — don't forget to cover the gap between the plywood and the PVC), I had my bird cage. In order to mend the chicken wire together and prevent gaps in the shell, I used zip ties to bond the separate strips of wire. Use plenty.

To complete the outer shell, I took an old 7-foot-by-10-foot tarp and stapled one end to the back wall, blanketed my cage, and pulled the tarp back roughly halfway to allow half of the cage to be in direct sun and the other half be covered. Adding the tarp is a critical step as it provides access to shade and protection from heavy rain.

So far so good, and the only question that remained was, "How will I move the coop?" The solution came in the form of two $\frac{7}{8}$ -inch eye bolts and a $\frac{3}{8}$ -inch nylon rope. I simply fed the rope through the eyes of the bolts that I screwed to the base



A well-constructed coop offers shelter for your flock and easy access for you.

frame on the end opposite the door, tied a big knot on each end — preventing it from slipping back through — and I was done. After a few test pulls around the backyard, I gave the design a thumbs-up and moved my 4-week-old chicks from their brooder room into their new home. Watching them experience lush green grass for the first time was almost as exciting as knowing that my brooder room chores for the season were finished.

Admiring the chickens as they foraged for the first time had me feeling pretty proud of myself. But no project can be complete without a few lessons learned. For instance, rather than screwing the PVC directly to the frame itself, I would spend a few extra dollars and use hanger brackets to attach the pipes to the frame. Because I didn't do that, I had a pipe break, which cost me another trip the hardware store. For the door, I would use at least $\frac{3}{4}$ -inch plywood rather than $\frac{1}{2}$ -inch. When it rains one day and turns hot the next, thin plywood warps easily, making it difficult to open and close. And if I had to do it all over again, the most fundamental improvement I would make would be to use a thicker rope as means for relocation. This

simple improvement would make pulling the coop a bit more pleasant. When the pasture reaches 18 inches in height, your hands can really take a beating during a summer of pasture-based chicken farming.

Later, after my broilers had been processed, removing one of my diagonal roosting boards was a breeze, and the structure quickly converted to a cold frame for spinach, kale and greens.

While the construction of this chicken coop was accomplished in less than four hours, the benefits were immeasurable. In one afternoon, I had built housing for 30 birds that were free to range in daylight all summer, while they retired to clean bedding each evening, safe from predators. Even in late August when Hurricane Irene hit, my chicken coop remained unscathed and never moved an inch. Perhaps the achievement I am most proud of is that I lost zero birds in the pasture last year, letting them range enclosed with an electric fence during the day and closing them in, in my \$50 coop, at night. My cheap, do-it-yourself chicken housing was a success around the farm, and now in midwinter, chicken dinners with dignity are nothing short of luxurious. 🐔

CHICKEN ON EACH SEASON'S TABLE

Try poultry with fresh vegetables and herbs for a wonderful meal in the spring, summer, fall, or winter.

*Recipes and photographs courtesy
National Chicken Council*

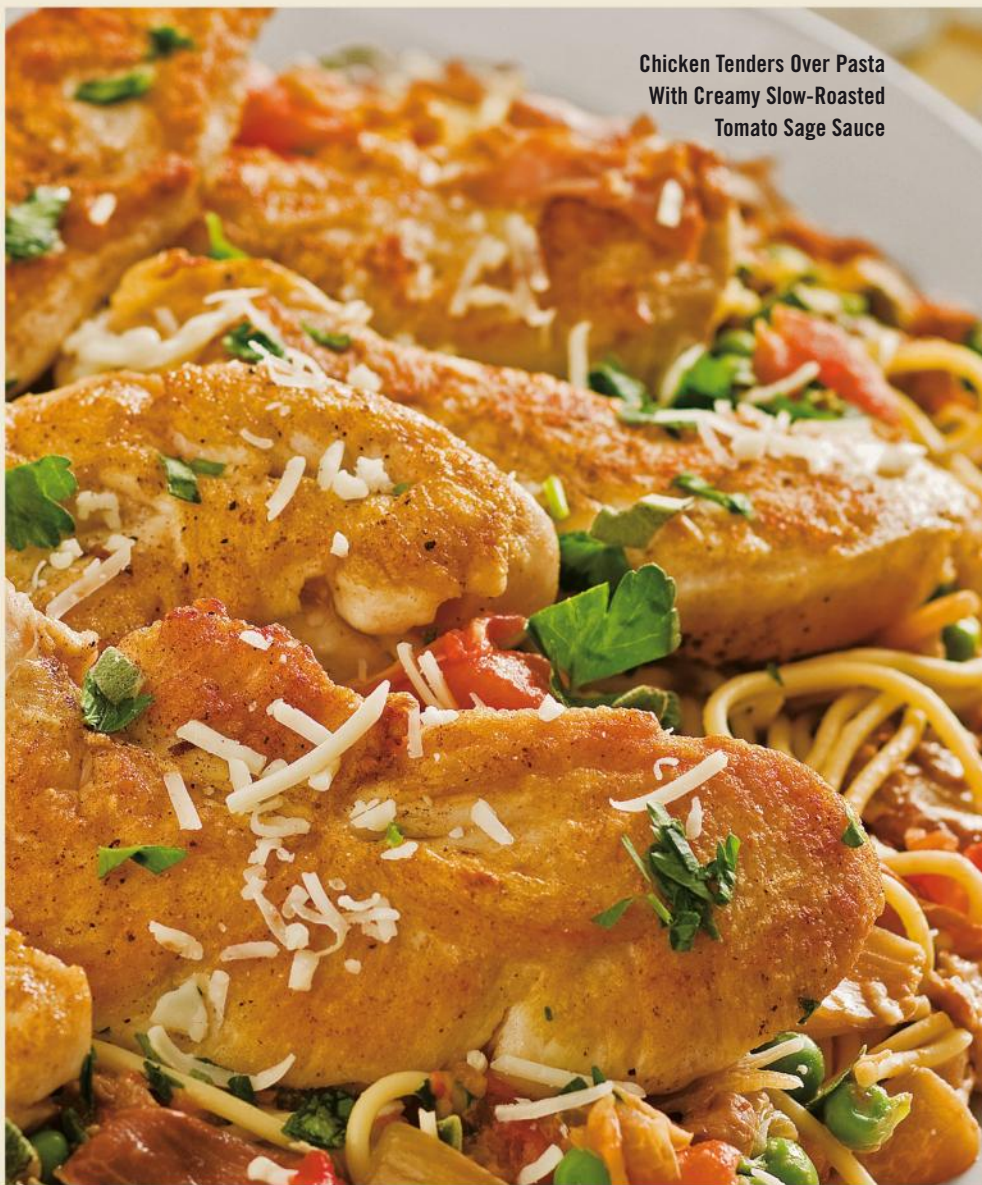
No matter the season, tantalize your family's taste buds with chicken, fresh vegetables and seasonal ingredients. Take advantage of spring's first fruits and vegetables, use summer's favorite cooking techniques on the grill, think herbs and spices with autumn's vegetables, and fight off winter's cold, all with chicken in the pot.

The National Chicken Council in Washington, D.C., has developed chicken recipes bursting with the flavor of each season. In addition to a variety of chicken parts, the recipes all feature herbs or vegetables whose appearance at the grocery store and farmers markets signals the arrival of the season.

Springtime's Fresh Tastes

Chicken works well with delicate flavors like tarragon and mint, and is a perfect complement to spring's first fruits and vegetables: leeks, fennel, asparagus, strawberries.

Chicken Tenders Over Pasta with Creamy Slow-Roasted Tomato Sage Sauce features the versatile tender — the small strip of white meat cut from the side of each chicken breast. The sautéed chicken is served over spaghetti noodles tossed with a slow-roasted tomato sauce made with chunks of prosciutto, peas, sage, cream and roasted tomatoes. The dish is topped with Parmesan cheese and parsley before serving.



**Chicken Tenders Over Pasta
With Creamy Slow-Roasted
Tomato Sage Sauce**

Chicken Thighs Braised With Leeks and Tarragon

This dish involves slow-cooking succulent chicken thigh meat. Start by purchasing them bone-in, and remove the skin before preparing. Favorite spring vegetables are added to the pot to cook with the meat. Flavoring with the light herb tarragon gives this dish a final spring-like touch. Yields 4 servings.

- 8 chicken thighs, bone-in and skin removed
- ¾ teaspoon salt
- ¼ teaspoon black pepper
- 1 tablespoon olive oil
- 1 tablespoon butter
- 4 medium leeks, cleaned and cut into 2-inch lengths
- 4 carrots, peeled and sliced into 2-inch lengths

- 1 tablespoon chopped fresh tarragon
- 2½ cups chicken stock
- ½ cup heavy cream

1 Heat oven to 350 F.

2 Sprinkle chicken with salt and pepper. In large, oven-proof sauté pan with tight-fitting lid, heat olive oil and butter over medium heat until butter is melted. Add chicken and sauté for 6 to 7 minutes, or until browned. Turn and repeat.

3 Add leeks and carrots, and cook for another 1 to 2 minutes, stirring well. Add tarragon and chicken stock, and bring to a boil. Remove from heat and cover. Place pan in oven and braise for about 40 minutes, or until instant-read thermometer registers 170 F.

4 Remove pan from oven. Place chicken and vegetables on platter and cover with foil. Bring liquid in braising pan to a boil



on stovetop. Boil and reduce for about 5 minutes. Add cream and stir for another minute. Return chicken and vegetables to sauté pan and gently stir to combine, spooning sauce over chicken.

5 To serve, arrange chicken and vegetables on platter, and spoon sauce over the top.

Summer's Grilling

Although grilling is a year-round activity for many, there is something about the summer months that make cooking over the coals (or in a gas grill) even tastier.

Apricot-Glazed Grilled Chicken Wings

Apricot-Glazed Grilled Chicken Wings are as versatile as summertime eating needs, as this dish works as an appetizer, for picnics, cookout entrées, children's party meals and more. Chicken wings are grilled and basted in a hot sweet sauce made from apricot preserves, garlic, ginger, soy sauce, lime juice, balsamic vinegar and cumin. Serve hot off the grill, or cooked and cooled in the refrigerator. Yields 4 servings.

- 4 pounds chicken wings, tips removed and cut at the joint
- 1 teaspoon kosher salt
- ¾ cup apricot preserves
- 2 cloves garlic, mashed
- 1 tablespoon chopped fresh ginger
- ¼ cup soy sauce
- ½ teaspoon red pepper flakes
- Juice from one lime (about 2 tablespoons)
- 1 tablespoon balsamic vinegar
- ½ teaspoon cumin
- 2 tablespoons chopped chives
- Fresh lime wedges for garnish

1 Season wings with salt. Heat grill to medium high.

Chicken Tenders Over Pasta With Creamy Slow-Roasted Tomato Sage Sauce

Yields 6 servings.

TOMATOES:

- 6 Italian plum tomatoes
- ¼ teaspoon salt
- ¼ teaspoon black pepper

CHICKEN:

- 1 tablespoon olive oil
- 1 tablespoon butter
- 1½ pounds chicken tenders
- ½ teaspoon salt
- ¼ teaspoon black pepper

SAUCE:

- 1 tablespoon olive oil
- 1 medium onion, diced
- 2 ounces prosciutto, chopped
- ¾ cup heavy cream
- 1 box (16 ounces) spaghetti
- 1 bag (16 ounces) frozen peas, thawed
- 2 teaspoons chopped fresh sage
- ½ teaspoon black pepper
- ½ cup freshly grated Parmesan cheese
- 2 tablespoons chopped fresh Italian parsley

1 Heat oven to 250 F. Make slow-roasted tomatoes by slicing tomatoes in half lengthwise. Place cut side up on baking sheet; sprinkle with salt and pepper. Place in oven and roast for 2½ to 3 hours. (Tomatoes may be made ahead and stored in refrigerator for up to three days.)

2 TO PREPARE CHICKEN: In large skillet, heat olive oil and butter over medium-high heat until butter is melted. Season chicken with salt and pepper. Add chicken to skillet and sauté, turning once, until browned, about 3 minutes per side. Remove chicken from pan, cover and reserve.

3 FOR SAUCE: To same skillet, add olive oil. Add diced onion and sauté over low heat until soft, about 10 minutes. Add prosciutto and sauté for 30 seconds. Add slow-roasted tomatoes and break up with back of wooden spoon. Heat through for 30 seconds. Stir in cream. Remove sauce from heat.

4 Cook pasta according to package directions. When pasta is almost done, reheat sauce over low heat. Stir peas, sage, and pepper into sauce; heat through. When pasta is cooked, drain but do not rinse. Add pasta to sauce in skillet and toss well to combine. Add Parmesan and parsley; toss again. Place on serving platter and top with chicken.



Above: Apricot-Glazed Grilled Chicken Wings
Below: Grilled Chicken & Peach Kabobs



2 In bowl of food processor (small if available), combine preserves, garlic, ginger, soy sauce, red pepper flakes, lime juice, vinegar, and cumin; process until smooth. Add chives.

3 Place wings on grill and cook for 8 to 10 minutes. Turn and grill for another 5 to 6 minutes. With pastry brush or spoon, brush sauce on wings. Cook for another minute, and turn. Repeat on other side of wings. Wings should register 170 F when tested with instant-read thermometer.

4 Serve wings garnished with lime wedges.

Grilled Chicken & Peach Kabobs

Grilled Chicken & Peach Kabobs is an easy and delicious blend of the best flavors of the summer season. Thread chunks of boneless, skinless chicken breast halves onto skewers, interspersed with chunks of zucchini, peaches, and mushrooms. Marinate in a mixture of olive oil, mustard, vinegar, thyme, and orange zest before grilling. Yields 4 servings.

- 4 boneless, skinless chicken breast halves
- ¼ cup coarse grainy mustard

- 2 tablespoons red wine vinegar
- 2 teaspoons chopped fresh thyme
- 1 teaspoon salt
- ½ teaspoon freshly ground pepper
- 1 tablespoon orange zest
- ¼ cup olive oil
- 2 small zucchini, cut into ½-inch rounds
- 16 cremini mushrooms
- 3 ripe peaches, cut into eighths (may use frozen if fresh are not available)
- 8 wooden or metal skewers

1 If using wooden skewers, place in water and soak for at least 1 hour.

2 Cut chicken into 1-inch pieces. In small bowl, whisk together mustard, vinegar, thyme, salt, pepper, and orange zest. Slowly whisk in olive oil until combined.

3 Alternately thread chicken, zucchini, mushrooms, and peach slices onto skewers. Be sure to leave enough space at bottom of skewer to hold and turn.

4 Place skewers in single layer on sheet pan or baking dish, and pour marinade over the top, turning skewers to distribute marinade. Cover with plastic wrap or aluminum foil. Marinate in refrigerator, turning skewers occasionally, for at least 30 minutes or overnight.

5 Heat grill to high. Place skewers on grill and cook, turning often, for about 10 minutes.

6 Serve over rice.

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Fun Fall flavors

Along with cooler fall weather comes a bounty of late-harvest foods and flavors. This is also the time of year when heartier and richer dishes begin to appeal.

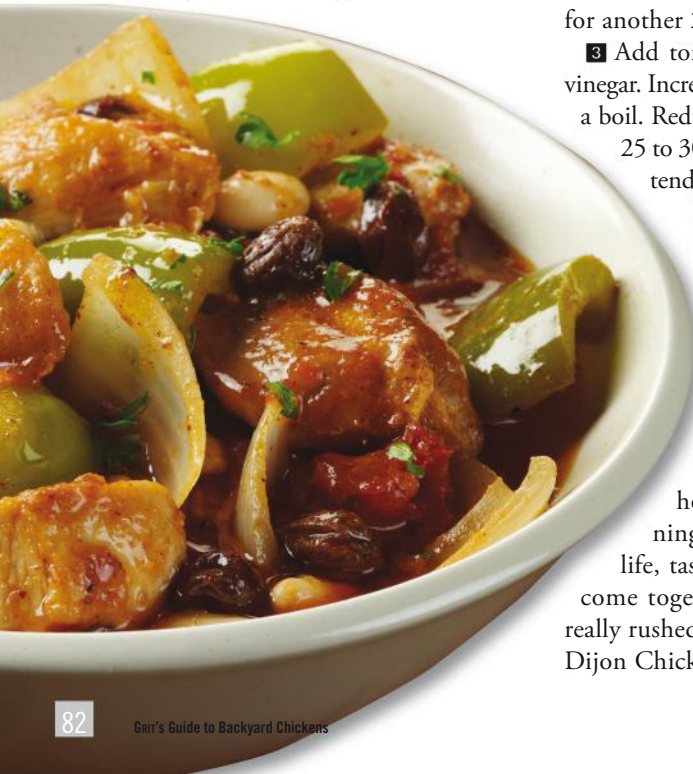
At Halloween “treat” friends to a special dinner of Roasted Chicken, Celery Root, Apples and Chestnuts With Apple Cider Pan Gravy (opposite page). This beautiful presentation of a whole roasted chicken couldn’t be simpler to prepare; just roast the bird with chopped fall favorites like celery root, apples and chestnuts. Rice or potatoes, a spinach salad, and a favorite dessert complete the meal.

Sweet & Spicy Tomato & Pepper Chicken Stew

If the crowd is coming to your house for football (and food), serve Sweet & Spicy Tomato & Pepper Chicken Stew, a recipe that easily can be doubled to accommodate more guests.

The basis of this dish is boneless, skinless chicken thigh meat, flavored with garam masala (a blend of round spices such as coriander, cumin, cloves, cinnamon, nutmeg, star anise and/or chilis used in Indian cooking), nutmeg, garlic, ginger, and vinegar. This is another terrific one-dish meal

Sweet & Spicy Tomato & Pepper Chicken Stew



that works particularly well served on a buffet. Yields 6 to 8 servings.

- 2 tablespoons olive oil
- 1½ pounds chicken thigh meat, boneless and skinless, cut into 1-inch cubes
- 1 green pepper, diced
- 2 Spanish onions, diced
- 2 cloves garlic, minced
- 1½ tablespoons chili powder
- 2 teaspoons garam masala
- ⅛ teaspoon ground nutmeg
- ⅛ teaspoon ground ginger
- ½ teaspoon kosher salt
- 2 teaspoons brown sugar
- 1 can (14½ ounces) diced tomatoes
- 1 cup low-sodium chicken broth
- ½ cup raisins
- ¼ cup apple cider vinegar
- 1 can (14½ ounces) white beans, drained and rinsed
- 4 tablespoons chopped fresh parsley

1 In Dutch oven, heat olive oil over medium-high heat. When hot, stir in chicken and sauté, stirring often, for about 5 minutes, or until chicken is browned on all sides.

2 Add green pepper, onion, and garlic. Reduce heat to medium. Cook, stirring occasionally, for 6 to 7 minutes, or until vegetables are softened. Add chili powder, garam masala, nutmeg, ginger, salt, and brown sugar. Sauté, stirring, for another 2 minutes.

3 Add tomatoes, broth, raisins, and vinegar. Increase heat to high and bring to a boil. Reduce heat; cover and cook for 25 to 30 minutes, or until chicken is tender and cooked through.

4 Stir in beans, and cook for another 2 to 3 minutes, or until beans are heated through. Serve garnished with chopped parsley, over rice, if desired.

On back-to-school busy weeknights, when homework, sports, and evening activities take over family life, tasty and healthy meals must come together quickly. When you’re really rushed, make Pan Roasted Maple Dijon Chicken With Butternut Squash

& Brussels Sprouts. The recipe features chicken drumsticks and thighs, cooked with chopped butternut squash and halved Brussels sprouts, and flavored together in a quick sauce of maple syrup and Dijon mustard. Make a pot of brown rice to serve for a hearty one-dish meal. Yields 4 servings.

Pan Roasted Maple Dijon Chicken

- 1 tablespoon olive oil
- 4 chicken thighs
- 4 chicken drumsticks
- ¾ teaspoon kosher salt
- ½ teaspoon freshly ground pepper
- 1 tablespoon unsalted butter
- 2 cups diced (1½ inch) butternut squash
- 16 Brussels sprouts (about 8 ounces), bottoms trimmed, outer leaves removed, and halved
- 1½ cups chicken stock
- 2 tablespoons maple syrup
- 2 teaspoons Dijon mustard

1 In sauté pan large enough to hold chicken in single layer, heat olive oil over medium-high heat. Season chicken pieces with salt and pepper. Add chicken to pan, skin-side down, and sauté for 4 to 5 minutes per side, or until chicken is browned.

2 Remove chicken from pan and reserve. In same pan, add butter and melt over medium heat. Add squash and sprouts, and sauté, tossing occasionally, until outsides are golden brown, 3 to 4 minutes. Remove from pan and reserve separately from chicken.

3 Increase heat to high, and add chicken stock, syrup and mustard. Bring to a boil, stirring to scrape up brown bits on bottom of pan.

4 Add chicken back to pan, and reduce heat to medium-low. Cover and cook for 20 to 25 minutes, or until chicken registers 170°F.

5 Add vegetables back to pan. Cover and cook for another 8 to 10 minutes, or until vegetables are tender.

6 Remove chicken and vegetables to serving platter, placing vegetables around chicken. Increase heat to high.

7 Boil sauce until reduced and slightly thickened, 2 to 3 minutes. Spoon sauce over chicken and serve.

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Delicious Winter Menu

Do you feel more at home in the kitchen during the winter months? There is something about the aromas and flavors of a hot meal that make the coldest days more pleasant. And with holidays abounding, there are plenty of reasons to gather friends and try out a new recipe.

Chicken & Red Lentil Stew

On a particularly cold night, try Chicken & Red Lentil Stew With Greens & Sweet Potatoes. This hearty dish features boneless, skinless chicken thigh meat, chunked and flavored with cinnamon, ginger, cumin, dried mustard, garlic, and cayenne pepper. Cooked with red lentils, diced sweet potato, and a dark green such as spinach or collards, it is the perfect quick one-dish meal. Yields 6 servings.

- 2 tablespoons vegetable oil
- 1½ pounds chicken thigh meat, boneless and skinless, cut into 1-inch cubes
- 1 teaspoon salt
- ¼ teaspoon cayenne pepper
- 2 cloves garlic, minced
- 1 tablespoon minced fresh ginger
- 1 medium onion, chopped
- 1 teaspoon cumin
- ½ teaspoon dried mustard
- ½ teaspoon dried coriander
- ¼ teaspoon cinnamon
- 1 tablespoon brown sugar
- 4 cups chicken broth
- 1 can (14½ ounces) diced tomatoes
- 2 carrots, peeled and cut into ½-inch rounds
- 2 small potatoes, peeled and diced into ½-inch cubes
- 1 small sweet potato, peeled and diced into ½-inch cubes
- 1 cup red lentils
- 1 bag (12 ounces) cleaned, chopped spinach
- 2 tablespoons freshly chopped cilantro
- 6 tablespoons plain yogurt or sour cream

1 In stock pot, heat oil over medium heat. Add chicken cubes and sprinkle with salt and cayenne pepper. Sauté for 2 to 3 minutes, stirring occasionally, or

until all sides of meat are browned.

2 Add garlic, ginger and onion. Sauté for another 2 to 3 minutes. Add cumin, mustard, coriander, cinnamon and brown sugar, and stir until combined. Add broth and tomatoes with juice; bring to a boil. Add carrots and potatoes. Return to boil; reduce heat and cook for 10 minutes. Add lentils. Cover,

and simmer for additional 20 minutes.

3 Using fork, check to be sure potatoes are soft. When soft, add spinach and stir to combine until spinach is wilted. Add cilantro.

4 Serve in soup bowls. Garnish each bowl with chopped cilantro and a dollop of plain yogurt or sour cream, if desired.

Chicken & Mixed Pepper Enchiladas

Yields 6 servings.

AVOCADO BLACK BEAN SALAD:

- 2 ripe avocados, halved, pits removed and diced
- 16 cherry tomatoes, quartered
- 2 tablespoons olive oil
- 1 can (15½ ounces) black beans, drained and rinsed
- 3 tablespoons fresh lime juice
- ½ teaspoon salt
- ¼ teaspoon black pepper
- 2 tablespoons chopped cilantro

LIME CREAM DRIZZLE:

- ½ cup sour cream
- 2 tablespoons fresh lime juice

ENCHILADAS:

- 2 tablespoons vegetable oil, divided
- 4 chicken breast halves, boneless and skinless, cut crosswise into ¼-inch strips
- 1 red pepper, diced
- 1 poblano pepper, diced
- ½ cup diced Spanish onion
- ½ teaspoon cumin
- 1 teaspoon chili powder
- ½ teaspoon paprika
- 1 teaspoon salt
- 1 tablespoon chopped fresh cilantro
- ½ teaspoon adobo sauce
- ½ cup frozen corn
- 12 flour tortillas (6-inch size)
- 1 can (10 ounces) **enchilada sauce**
- 1½ cups grated **queso blanco** (white Latin-style cheese)
- 3 tablespoons chopped cilantro for garnish

1 Make Avocado Black Bean Salad by combining all ingredients in medium bowl. Stir gently and reserve.

2 Make Lime Cream Drizzle by combining sour cream and lime juice in small bowl. Reserve.

3 Heat oven to 350 F.

4 In sauté pan, heat 1 tablespoon vegetable oil over medium heat. Add chicken strips and sauté until browned. Remove from pan and reserve. In same pan, add remaining oil and heat. Add peppers, onion, cumin, chili powder, paprika, and salt. Sauté until vegetables are soft, 5 to 6 minutes. Add cilantro, adobo sauce, and corn. Stir to heat through.

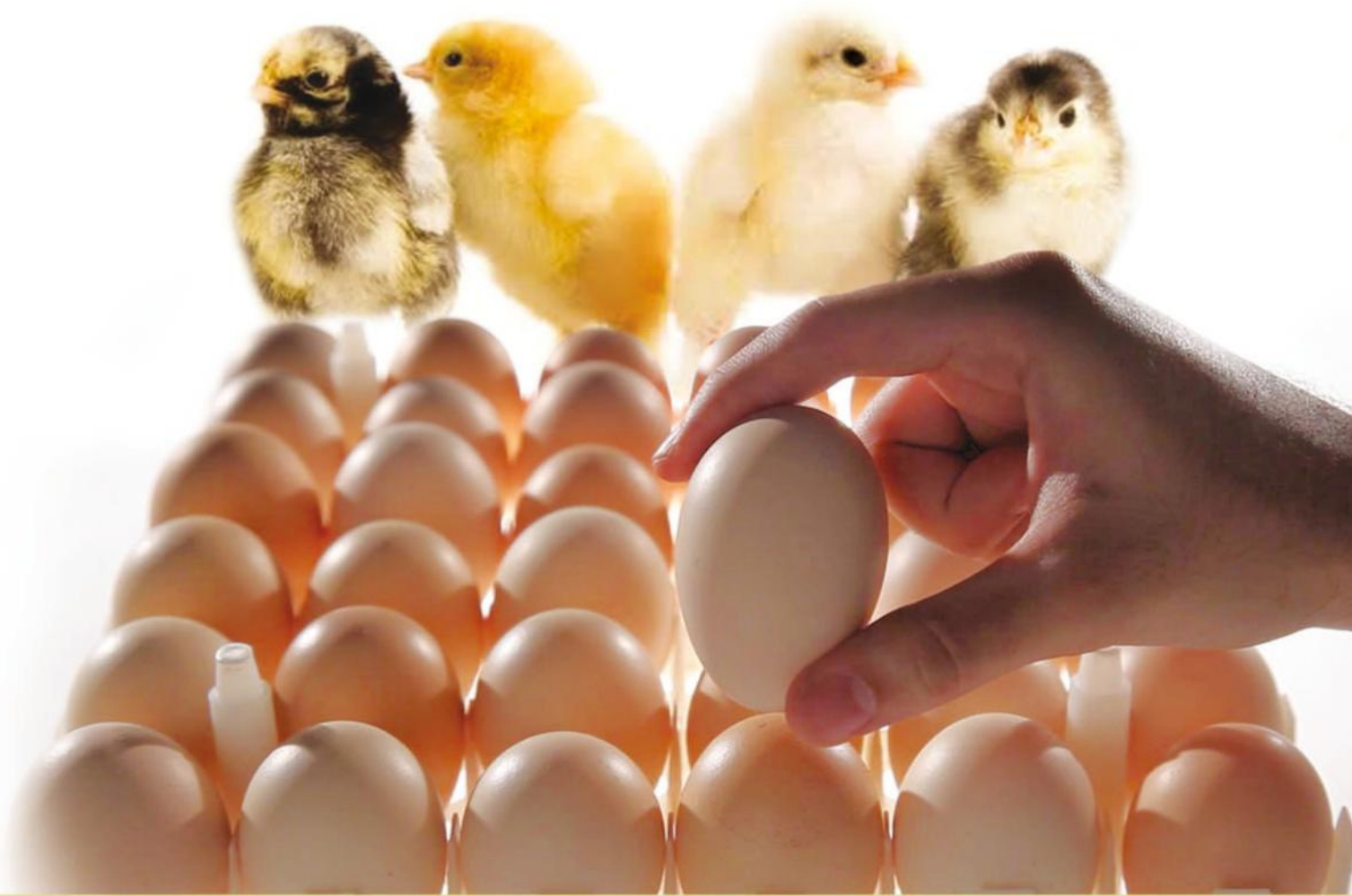
5 Spray large, oven-proof baking dish (or two medium-sized dishes) with nonstick cooking spray. Spoon about ¼ cup chicken mixture onto 1 tortilla; roll and place in pan. Repeat with remaining tortillas. Enchiladas should be placed tightly in pan. Pour enchilada sauce over tortillas. Sprinkle with cheese.

6 Bake until cheese is melted and enchiladas are heated through, about 20 to 25 minutes.

7 Serve 2 enchiladas per person. Top with Lime Cream Drizzle and garnish with chopped cilantro. Serve Avocado Black Bean Salad on the side. 🍴



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RAISING Guinea Fowl on Your Farm

A great addition to your livestock,
this type of poultry can help
keep gardens tidy and bug free.

By Christine Heinrichs

Poultry can make a great addition to your farm or small homestead. In *How to Raise Poultry* (Voyageur Press, 2011), Christine Heinrichs provides all of the information you need to successfully raise a flock of birds. This excerpt provides information on raising guinea fowl.

Raising Guinea Fowl

Guinea fowl are African birds that are still common, in many species and subspecies, in the wild. The diversity of

African climates has influenced development of varied guinea fowl.

Many people keep them as insect-control birds. They eat all kinds of pests, including deer ticks, an important point for those who live in areas threatened by Lyme disease. They happily consume Japanese beetles, wasps, and other pests but, unlike chickens, don't scratch and dig up the garden.

Guinea fowl are credited with killing and eating small snakes and rodents. Sharon Wilson of Texas witnessed

them killing a 6-foot snake at a guinea fowl farm. Their screeching alone is said to discourage rodents. Jeannette S. Ferguson has written an entire book called *Gardening With Guineaas*.

Then again, their screeching may discourage you and annoy your neighbors.

My husband finds them unbearably annoying. R.H. Hastings describes their constant chatter as "A running commentary on the nature of the food" that "will fetch other guineas from many yards away to share the delicacy."

The positive side of this characteristic is that they serve as excellent watchdogs and will warn you of any unusual occurrence on your farm.

Guinea fowl like their own reflections, so if they are settling in places you don't want them, try hanging a mirror where you want them to nest. They will find it and move.

History and Culture of Guinea Fowl

Fossilized remains of guinea fowl date back 2.5 million years, in what is now the Czech Republic, where they roamed the landscape with prehistoric elephants and lions. Indian and Burmese people may have kept guinea

fowl since Neolithic times, as early as 7000 B.C. They were domesticated at least 4,000 years ago, showing up in an Egyptian pyramid mural of 2400 B.C. The nobles of that period, the Fifth Dynasty, enjoyed maintaining aviaries.

Some guinea fowl were indigenous to the area, and others were imported from farther south in Nubia, Sudan, Ethiopia, and Somalia.

With the arrival of early domesticated chickens by 1475 B.C., poultry husbandry increased. Egyptian incubators of the time could accommodate up to 90,000 eggs, both guinea fowl and chicken eggs.

Whether Greek farmers acquired guinea fowl from Egypt or elsewhere, the birds were being raised on Greek farms by 400 B.C. Guinea fowl are among the birds associated with the Greek goddess Artemis. In one tale, the sisters of the hero Meleager wept themselves to death after Meleager died. Artemis rescued them from Hades and turned them into guinea fowl. The spots on their feathers represent the sisters' tears.

Whether this myth accounts for the scientific name for helmeted guinea fowl, *Numida meleagris*, or the name is a corruption of *melanargis*, meaning black and white, remains unresolved. Domestic guinea fowl were developed from the helmeted species.

Roman writers like Horace, 23 B.C., and Pliny in his natural history, A.D. 77, mention eating both the meat and eggs of guinea fowl.

Romans likely distributed the birds across Europe with the spread of their empire. As the Middle Ages advanced, guinea fowl disappeared from the menu. Portuguese traders reintroduced guinea fowl in the 14th and 15th centuries. Turkeys were arriving from the New World at the same time, resulting in some confusion as to what they were. That confusion was reflected in their names, with turkeys eventually being designated *Meleagris gallipavo*. *Pavo* is the Latin and Spanish word for peacock, so the Spaniards who brought turkeys back to Europe initially called them *pavo de las Indias*, the "peacock of the Indies."



Whether in a group or alone surveying its surroundings, guinea fowl are challenging to own, yet offer a wide variety of benefits: an alarm system, pest control and entertainment.

The popular name turkey already meant guinea fowl in Europe. The American bird soon won that name, but the confusion lingered.

Turkeys and guinea fowl aren't related, except in the sense of both being fowl. They both just looked weird to the Europeans.

Guinea fowl traveled to America with the slave trade, where feral flocks were established in the Caribbean islands during the 1700s. In China, they became known as pearl fowl and were quickly adopted. By the 18th century, they were widely cultivated.

Victorian England raised the guinea fowl to the status of one of its most popular table birds, a luxury item with prices at record highs.

Production has declined since then, but interest in gourmet, alternative and local food could open new markets. Modern breeding practices and selection have developed guinea fowl varieties that mature more quickly and extend the laying season to provide eggs and chicks for production almost year-round.

Despite centuries of domestication, guinea fowl retain a lot of wildness. They prefer to range free, and they fly well. Most owners allow them liberty and occasionally find them roosting on the barn or house roof and in trees. One owner describes the experience of having guineas as comparable to "an eccen-

tric but wealthy relative who has come for an extended visit — tolerated, even welcomed, in the unspoken hope that one day their benefits will outweigh their inconvenient behaviors."

Raising Keets

When raising guinea fowl, it's best to start with babies, or keets. That gives you the opportunity to tame them and give them the basics of training.

You can purchase keets from a breeder or hatch eggs. Chickens make good foster mothers, if you are already established with chickens.

A large-breed chicken may be able to cover as many as 40 guinea eggs. Chicken eggs have an incubation period of 21 days, whereas guinea eggs require 26 to 28 days to hatch, but a broody hen will not mind the week longer. Artificial incubators are also successful.

Guineas also like to nest and raise their own keets. Guinea hens can be very secretive about making nests for themselves, but unfortunately, they may not choose locations safe from predators. Jeannette Ferguson recounts, in her book *Gardening with Guineas*, the experience of one guinea who succeeded by building a nest under a pile of barbed wire. That's the exception to the rule, however.

When a hen doesn't come back to the house at night, follow the rooster guarding her. Guineas are mostly

monogamous, and he will be protecting the hen on the nest.

The eggs are smaller than chicken eggs, weighing 1.4 ounces compared to the 2-ounce chicken egg. They have thick shells that make them difficult to candle. Use a bright light source on the 10th day of incubation to check for development.

The keets are very tiny and must be managed carefully. A foster chicken mother may do a better job than a guinea mother and father.

Domestic guinea fowl are often not very good parents, although both participate in raising the keets. Because their origins are on dry grasslands, they don't manage moist conditions like wet grass well. Keets may die from getting chilled.

A guinea mother may leave the nest before all the keets are hatched. Confining the family in a pen on bare ground or short grass until the keets are fully feathered, around 6 to 8 weeks old, will help to improve the parents' chances of raising their family successfully.

Keets should be kept on cloth or plastic with a rough texture so they can get traction without falling. Their legs are weaker than chickens', and early leg injuries will persist throughout the bird's life.

Training Guinea Fowl

Guinea fowl have their own view of the world and their place in it. They retain an independent nature, although training makes them more manageable. Ferguson recommends white millet as a special treat to give some measure of influence over guineas. Associate yourself with food treats, and they will learn to come when called.

Guinea fowl do best with people if they are raised with a lot of gentle handling. Spend time with them and handle them daily. Otherwise, they may be so skittish you will have difficulty approaching them.

Feeding Guinea Fowl

Keets do well on turkey starter or game-bird feed, which have 24 to 26 percent protein, until they are fully



Be aware of the noise and eccentricities of guineas before adding them to your backyard flock.

feathered and can be set outdoors. Medicated feeds are not recommended, since they are not formulated with keets in mind, and the birds may ingest an overdose when they go through growth spurts and eat more.

On sufficient range, keets will eat enough bugs and seeds to satisfy the nutrition needs of their entire diet.

If they don't have enough to eat, supplement them with chicken layer crumbles or game-bird feed with higher protein content. They need grass. If they are confined or grass is limited, give them alfalfa hay.

They are willing consumers of all kinds of kitchen trimmings. Avoid giving them anything that you don't want the birds to help themselves to later in your garden.

They like fruit and berries but don't usually bother vegetables much. Chopped garlic and onions reduce worms and may help birds resist respiratory problems and coccidiosis. Edible seaweeds, such as kelp, are welcome sources of minerals.

Keets will also eat bees, so keep hives

and guineas separate if you are raising honeybees at the same time.

Housing for Guinea Fowl

Guineas raised for meat and egg production can be confined as other poultry are. Small-flock owners usually let them range. Their love of tasty food can be used to train them to come when called. Although they prefer to roam free, they are vulnerable to predators and should be secured in a protective shelter at night and during harsh weather. Although they fly well, they generally try to escape from predators by running, often unsuccessfully. Left alone, they will roost at night in trees, where they are vulnerable to owls and hawks.

One Texas breeder uses an old-fashioned buggy whip to herd his birds into their house for the night. He scatters grain on the ground and then uses the whip as an extension of his arm to guide them toward the house.

An existing building can be converted to a guinea house, or you can build one for the purpose. Confined birds should each have 3 to 4 square feet.

Surround the house with a fenced yard. Allow 20 square feet per bird in a breeding pen. Natural shrubs and trees inside the enclosure provide guinea fowl with places to perch. Shrubbery and climbing plants planted around the outside can be trained to grow over the fence. A sandy spot in the sun for dust baths helps keep their feathers in good shape. Guineas will happily fly over the fence unless the aviary is completely enclosed. If you allow them free range, accommodate them with 2X4s around the top of the fence, to land on as they make their way over.

Guineas prefer to roost as high as they can.

"All species of guinea fowl are always eager to see what is going on around them," writes R.H. Hastings Belshaw in *Guinea Fowl of the World*. Provide at least 10 inches of roost per bird.

Guinea Fowl Breeds and Varieties

There are six separate species of guinea fowl: white-breasted guinea fowl, *Agelastes*

A guinea hen shows her new brood the ins and outs of foraging for bugs.



meleagrides; black guinea fowl, *Agelastes niger*; helmeted guinea fowl, *Numida meleagris*; plumed guinea fowl, *Guttera plumifera*; crested guinea fowl, *Guttera pucherani*; and vulturine guinea fowl, *Acryllium vulturinum*.

The helmeted guinea fowl gave rise to today's domestic varieties and is the species most commonly kept, but fanciers keep crested and vulturine guinea fowl. The others are rarely kept in captivity outside of zoos or game parks.

Guinea fowl are raised in many colors: pearl gray, white, lavender, royal purple, coral blue, buff dundotte, buff, porcelain, opaline, slate, brown, powder blue, chocolate, violet, bronze, sky blue, pewter, light lavender, and pied. Pearl refers to the white dots on the feathers. Pied birds have white patches in otherwise colored plumage.

Guineas are exhibited at poultry shows. The Standard of Perfection recognizes three colors for exhibition: pearl, lavender, and white.

Exhibition weights range from 3 to 4 pounds. Underweight and overweight birds are penalized.

Males and females are similar in appearance. Males develop larger wattles, but that's a relative quality. Only females make the shrill "come back, come back" call. Some start making this call as early as 6 weeks old, but others may not start

calling until they are older. The male has only a single call, a high-pitched single syllable. Hens can successfully imitate it, so rely on both larger wattles and sound to determine which you have.

Guinea Fowl Products

Guinea fowl are in demand as table birds at gourmet restaurants and retail markets, if you are able to make the connections and develop the niche. They are seasonal egg layers, naturally laying from the end of March through mid-May, with the potential of producing as many as a hundred eggs a year.

Despite being limited by the season, the unusual dark shells and small size of guinea eggs make them eye-catching for specialty retail and restaurant trade. For cooking purposes, two guinea eggs are equivalent to one chicken egg.

Guinea hens, left to their own devices, lay about 30 eggs at the rate of one a day and then go broody.

To sell eggs for food, gather them at least once a day. Leave four to six dummy eggs in the nest to attract the hen to return and lay in that nest. Egg-layers may be kept confined each day until afternoon to persuade them to lay in the house or yard. Continually removing eggs extends the laying season, as long as to October.

As meat, guineas raised on broiler diets are large enough to be processed as early as 10 weeks of age. Breast meat increases if raised to 16 to 18 weeks of age. Smaller birds may be marketed as substitutes for partridge or quail. Live weights of 2¼ to 3¼ pounds produce dressed weights of 2¼ to 2¾ pounds, suitable for a meal for four people. Currently, dressed birds weigh 3 to 4 pounds and sell at retail for more than \$10 a pound.

The meat is similar to that of other game birds in flavor, according to Worldwide Gourmet. Nutritionally, it is lean and low in sodium.

Depending on the guinea's diet, the meat may also be high in fatty acids. It is low in calories at 134 calories per 100 grams, or 3.5 ounces. Comparatively, turkey has 109 calories per 100 grams.

The feathers of guinea fowl are sought both by flower shops and craft and specialty businesses. Lavender, purple, blue, and pearl varieties with their attractive dots, are especially in demand. 🐔

This excerpt has been reprinted with permission from How to Raise Poultry: Everything You Need to Know by Christine Heinrichs, and published by Voyageur Press, 2013.

Backyard Quail Basics



Not incredibly different from raising backyard chickens, quail will have you harvesting eggs and meat in no time — and their calls are cool too!

By Carole West

In the last several years, the homesteading movement has swept across North America. Numerous folks have started growing vegetables and fruits, as well as raising chickens and other animals, which establishes self-sufficiency and a visceral sense of fulfillment.

But often flying under the radar in the backyard bird-raising trend are additional yet unconventional options, like quail.

Quail provide eggs, meat, and hours of enjoyment. They're quiet, detailed, efficient birds that complement a self-reliant lifestyle. Whether you have a fenced backyard or acreage to roam, you can raise these birds on a manageable scale in a natural environment.

At any rate, raising quail certainly enriches the homestead lifestyle.

Legalities

It's likely you can legally raise quail in even your small urban backyard; they're a wild game bird separate from

the poultry and livestock categories. Some municipalities that restrict residents from raising certain “farm animals” like chickens leave quail off of the restricted list. However, because they're game birds, it's always recommended to see if your state, county or town has restrictions before getting started. Often, you can contact the local wild game bird association and they can refer you to that information and more.

Once you have the go-ahead, there are a few things to consider before you begin. Start by researching quail breeds, necessary supplies, where to purchase birds, housing, and how to deal with predators.

Breeds for Starter Flocks

Beginners typically begin with the hardiest quail breed, the Coturnix, also known as Japanese quail. This breed was imported to North America in the late 1800s for the purpose of eggs and meat, as well as released as game birds.

This is the fastest growing breed among quail and can be raised in all

types of environments. The Coturnix matures between 6 and 8 weeks of age. You'll be amazed when they start laying eggs between 6 and 8 weeks old — it takes about three to four jumbo Coturnix quail eggs to equal one chicken egg. Be sure to wait until they're at least 11 weeks old before processing for meat.

Other breeds to consider once you've gained experience are the native breeds. My favorite is the Bobwhite; they're perfect for meat and release, and they have one of the most recognizable, pretty quail calls of them all. You'll find other breeds like the Gambel's, Mountain, California, and others across North America. Some states have restrictions against raising native breeds, so do your research. Information varies from state to state.

Purchasing quail can be done online through wild game hatcheries, or Craigslist can be an option. Or, as with chickens, you can incubate fertile quail eggs.

Chicks, Supplies, and Setup

If the idea of raising quail has sparked your interest, the best way to



begin is with chicks. Beginning with babies will establish a strong immune system within your beginner flock, and will help you learn as much as you can about raising quail. Chicks are small, fast, and a bit messy. But there are a few things that can make the brooder stage less difficult.

Brooder containers consist of a plastic tub with a wood wire frame lid. A lid is necessary because the quail will fly out of open spaces, sometimes within the first one to four days after they arrive. Brooders should be set up and ready to go prior to your chicks hatching or otherwise arriving.

Bedding is necessary and should always be kept clean. I use hay instead of shavings. It's less messy, and it inspires the quail nesting instincts.

Heat lamps are used to keep the birds warm. This is vital, and temperature at chick level inside the brooder should be 95 to 97 degrees Fahrenheit the first week.

Like chicken chicks, young birds that are too cold will bunch up under the heat source, while birds moving away from the heat source indicates too much heat. You want comfortable chicks evenly dispersed throughout the brooder. The temperature can be reduced 5 degrees per week until it reaches 75 degrees, and the chicks will be

fully feathered. Choose a colored bulb if possible — this will keep the birds calmer and decrease pecking. Make sure to plug in your heat light to a reliable energy source.

Water containers can be small, and you need to add pebbles or marbles to the rim. This simple step can keep baby quail from drowning. When the birds are about 3 or 4 weeks old, you can remove the marbles.

Feed begins with wild game starter crumbles. You can also use a chick feed starter. You're looking for a nonmedicated, 30-percent protein feed in the form of a crumble. Grinding their feed the first few days makes it easier to digest. Feed can be purchased in 50-pound bags. Treats can be introduced by the end of the first week. They will enjoy meal worms and small bits of fruit. Feed dishes should be small so the quail cannot sit in their food.

It's extremely important to keep the quail brooders clean. Babies tend to eat their own feces, which can cause disease resulting in death. Clean the brooder containers at least every other day. Water and food dishes will need to be cleaned at least two or three times a day.

Quail chicks will live in the brooder until they are fully feathered — this will be about 3 weeks of

It takes about three to four jumbo Coturnix quail eggs to equal the size of one chicken egg. But, quail start laying much younger, usually between 6 and 8 weeks of age.



Clockwise from top left: Gambel's quail are popular in the Desert Southwest; Bobwhites have an unmistakable call; and Chinese Painted quail are more common overseas.

age. Only then can they be sent outdoors to their stationary or mobile home.

The Quail Home

Quail housing is an important part of the planning process. Each quail requires 1 square foot of space. You never want to overcrowd your birds, as this can lead to fighting and disease. Available space will determine your setup, but your two options in a general sense are mobile and stationary housing. These options can both include interaction with the ground, where the birds live and nest in a natural environment.

Mobile housing is nice for those with limited space. These setups are perfect for the backyard or for someone who wants to try raising quail on a small scale to see if they like it.

A mobile house can be as simple as a wooden frame enclosed with wire, where you have access by roof and end door. The frame lays flat on open ground, keeping the birds safe from all types of weather and ground predators. This housing option allows the birds to nest on the ground, eat bugs, and keeps the quail from flying away.

You move the house about every two or three days onto fresh grass — this means no ongoing purchase for shavings. The grass is naturally

fertilized and revives quickly. The quail have the opportunity to nest and lay their eggs on the ground, where they also enjoy hunting for bugs in addition to their feed diet, scraps and treats.

Stationary housing is similar, but you have the opportunity to add height and additional square footage. This type of housing does not move due to size. The added space allows the birds to test their flight skills and offers additional interaction with the ground.

Keeping quail warm and shaded from different types of weather is simple by adding shelter boxes to both types of housing options. Shelter boxes are three-sided with a roof and can be moved as needed. The quail use these shelters for a variety of purposes.

Quail can live naturally with both options of housing. The one best for you will depend on the size of flock you want to raise and the space you have available.

Natural Quail Settings

Keep expenses minimal by supplementing a quail's diet with natural living conditions and the ability to forage. These birds love grasshoppers and crickets; they also enjoy flies or almost anything they can grab. They're quick and always on the



hunt when provided an opportunity to live on the ground in a protected environment.

What I really love about these birds is the hours of enjoyment they provide. Their instincts are incredible, and they use their environment as a way to entertain and calm themselves.

Tall grass is a big attraction; they use it for nesting and camouflage shelter. Wild quail are routinely seen marching along with their flock, and this is how they discover new places to nest and food to eat. The sound of flight speaks freedom. For quail, it's an opportunity to escape predation.

Protection From Predators

Protection from predators is always a concern whenever you decide to raise animals, and especially when you decide to raise game birds and poultry. Some of your biggest threats will be dogs, coyotes, bobcats, raccoons, skunks, owls, hawks, and vultures, to name a few. City, suburb, and country environments all deal with some type of predation — it's important to be prepared to protect your investment and eliminate stressors on your birds.

For those with backyards, make sure your quail house is placed in a fenced-in yard. Either housing option will keep your birds safe from

flying predators. With stationary housing, build the setup away from the fenceline if possible. The temptation is great for dogs to dig and otherwise find a way over or through your fence.

For those with land, the list of predators expands, and the same rules apply. Always place your quail house in a fenced-in area. If you want to keep ground predators off your property, a strong, welded-wire fence is a great place to begin. You don't need to fence in all your land — start with a small area and slowly add to that over time.

Remember the quail will be living in a closed-in house, but if they're not in a fenced-in area, coyotes or dogs could easily dig their way in and destroy everything you've work so hard to establish. Predators are hungry, and they will do whatever it takes to get what they want. Plus, as a responsible animal husband, there's nothing worse than arriving late to the scene of predation on your animals.

Enjoy the process of raising quail. This experience is an opportunity to add a little self-reliance to your lifestyle and discover the beauty of a bird you might be less familiar with, yet deserving of your efforts. Plus, the eggs, and especially the meat, are a delicacy in many parts of the world.

Welcome to the possibilities and advantages of backyard quail! 🐣

Clockwise from top left: The author's Coturnix quail, perfectly content in taller grass; permanent quail housing; and a group of Coturnix quail venture out of a shelter box.



DUCK, GDUCK, GOOSE!

Heritage ducks and geese can provide benefits around the farm that other poultry cannot.

By Jennifer Kendall

Photographs courtesy of the Livestock Conservancy

Ever thought of adding ducks or geese to your home farm flock? While the chicken craze continues to sweep the country, lesser-known fowl species, such as ducks and geese, are also growing in popularity. Ducks and geese are useful, charming, and great additions to the small farm or homestead. They'll do your yard work — offering free pest control and weeding — in addition to producing high quality eggs. They can further boost your output in the form of meat and feathers. Take a look at some of these endangered breeds of ducks and

geese, and see where they might fit into your plan.

Saxony duck

STATUS: THREATENED

Looking for a good all-around duck for the farm or homestead? Look no further than the Saxony duck. Originally developed in Germany in the 1930s, Saxons were left almost extinct after World War II. During the aftermath, the breed's original creator, Albert Franz, began developing the breed once again. This time the breed survived, and, in

1984, it was imported to the United States by Holderread Waterfowl Farm and Preservation Center. Today, the breed is a triple-threat, providing quality meat, large eggs, and beautiful feathers.

Many breeders suggest that the Saxony is one of the most attractive and useful of the large duck breeds. Saxony ducks average 6 to 8 pounds when mature. Male Saxony ducks have blue-gray head, back, and wing markings; their breast feathers are a rich chestnut-burgundy; and the underbody and flanks are cream-colored. Female Saxony ducks are buff-colored with creamy white facial stripes, neck rings, and underbodies. The breed is an active forager and quite self-



Top to bottom: In addition to its striking colors, the Khaki Campbell has superb foraging ability and can serve as effective biological pest control on your land. These Swedish ducks are a great choice for a beginner: They're calm, easy to handle, forage well, and thrive outside of confinement. **Opposite page:** These African geese are popular table birds because of their large size and exceptionally lean meat.

sufficient, which can lead to slightly longer maturation times than some commercial breeds. Farmers can expect 190 to 240 large, white eggs each year. Despite its many great qualities, the Saxony breed is again near extinction, with fewer than 1,000 breeding birds existing in the United States. Consider Saxony ducks to help to preserve the breed.

Campbell duck

STATUS: WATCH

In the 1800s, Mrs. Adele Campbell of England developed the Khaki Campbell duck. Mrs. Campbell wanted to provide her family with a consistent supply of roast duckling, so she crossed several breeds to develop the modern Campbell. Today, the Campbell duck is reputed for its prolific

laying ability. Farmers can expect 250 to 340 eggs each year, all with superb flavor and texture. In addition to being a noted layer, the Campbell is an excellent forager, consuming slugs, insects, and even mosquito larvae from ponds.

Thanks to its origins, the Campbell also makes a respectable table bird with high-quality meat.

While the original Campbell duck was khaki (the only color recognized by the American Poultry Association), the breed does come in a variety of additional colors, including white, dark, and pied. Campbell ducks weigh an average of 4 to 4½ pounds.

This duck variety adapts to a range of climates and has thrived in tropical and cold climates as well as deserts. Farmers considering Campbells should ensure there is plenty of space for the ducks to graze and forage, as they can be somewhat energetic. With the current growth in popularity of duck eggs, Campbells are becoming a more regular sight in small poultry operations.

If eggs are a consideration, be sure you have true Campbells when choosing stock — many crossbred strains have lost their egg production qualities.

Swedish duck

STATUS: WATCH

As their name suggests, Swedish ducks originated from stock found in Sweden. In Europe, blue-colored ducks were thought to be more hardy and superior meat producers, making this blue-toned beauty a popular choice for centuries. Today, the Swedish duck is still considered a utility meat bird for the farm, but it also makes a good pet and ornamental bird for the pond. Their relatively calm nature makes them a good option for beginning duck raisers.

From a market standpoint, the Swedish duck will be more difficult to dress-out as cleanly as a white-feathered bird, but its coloration has the advantage of hiding unsightly dirt and mud stains.

The breed is medium-sized, averaging 6½ to 8 pounds. Blue is the only color recognized by the American Poultry Association, but the breed can be found in black, silver and splash color patterns. With this breed, you can expect 100 to



Left to right:
The Saxony duck is a producer of high-quality meat and eggs. The breed was developed in Germany and brought to the United States after the Second World War. Although the history of the American Buff goose is somewhat obscure, it was developed in North America and is descended from the wild Greylag goose.

150 white, green or blue-hued eggs each year. Swedish ducks need room to forage, and they generally don't thrive in confinement. Because of their adaptability and good egg-laying nature, Swedish ducks are making a comeback on small farms and homesteads, which has helped to improve their numbers.

American Buff goose

STATUS: THREATENED

Looking for the perfect holiday roasting bird, or maybe just a friendly pet for the farm? The American Buff goose will meet those needs — and more.

As its name suggests, the American Buff goose is an American original, though its exact origin and history is difficult to pin down. The breed is famous for hardiness and calm nature.

The American Buff goose's beautiful fawn-apricot color makes it one of the most colorful and attractive geese. In addition to being excellent foragers, American Buff geese are ideal roasting birds because their coloration allows them to dress almost as cleanly as white geese. The Buff's coloration has yet another advantage: The birds don't soil as easily as white geese.

The American Buff is the largest of the medium-weight goose breeds, with females averaging 16 pounds and males averaging 18 pounds. The breed's orange bill and feet and brown eyes are a stark contrast to its buff-colored body. For the farmer looking for a well-rounded goose, the American Buff's temperament, mothering abilities, and easy-keeping

make it a good choice. Expect 25 to 35 eggs per year.

Today, the American Buff goose is endangered, with fewer than 1,000 breeding birds in the United States. Help restore this American original and enjoy keeping a pair on your land.

African goose

STATUS: WATCH

While the name might make it seem that this breed is straight from the plains of Africa, that isn't strictly true. Though the breed's history is not clearly documented, it's thought the African goose is a relative of the Chinese goose, both having descended from the Wild Swan goose of Asia.

The African goose has a distinct appearance, and it is sometimes referred to as the "stately gentleman" of the goose world.

African geese are quite large, weighing 18 to 22 pounds, which classifies them as heavyweight geese. Their massive size

reflects strength, power, and vitality. They are also known for the well-developed distinguishing knob on their foreheads and the dewlap that hangs from their lower jaw and upper neck.

African geese produce some of the leanest meat of the heavyweight goose breeds, making them popular with many producers. The breed is also known for being hardy and fairly cold-tolerant, though shelter is needed when temperatures are near freezing to protect from frostbite.

This brawny beauty comes in gray/brown and white. African geese have a deep, melodious voice, and can sometimes be a bit noisy — but if you are looking for a guardian animal, this could be advantageous. African geese, with their great foraging abilities and ornamental good looks, make great additions to the farm flock.

Today, African geese are improving in number as more and more breeders are discovering their utility. 🦆



ABOUT TLC

The Livestock Conservancy is a nonprofit membership organization working to protect more than 180 breeds of livestock and poultry from extinction. Founded in 1977, the Conservancy is the pioneer organization in the United States working to conserve historic breeds and genetic diversity in livestock. The Conservancy's mission is to ensure the future of agriculture through genetic conservation and the promotion of endangered breeds of livestock and poultry. Basic membership in the organization is \$45 per year.

For more information or to join The Livestock Conservancy, call 919-542-5704 or visit the website www.livestockconservancy.org.

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